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NEW DIRECTIONS FOR INSTRUCTION IN THE JUNIOR COLLEGE, A REPORT OF A NATIONAL CONFERENCE SPONSORED BY UCLA, AAJC, AND THE ACCREDITING COMMISSION FOR JUNIOR COLLEGES OF THE WESTERN ASSN. OF SCHOOLS AND COLLEGES (JULY 15-17, 1964). (TITLE SUPPLIED).

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THIS CONFERENCE REPORT INCLUDES THE TEXTS OF 21 PAPERS ON TOPICS IN THE AREAS OF (1) IMPROVEMENT OF THE QUALITY OF INSTRUCTION IN HIGHER EDUCATION, (2) PREPARATION OF JUNIOR COLLEGE FACULTY, (3) EXPERIMENTAL COLLEGES, (4) PROGRAMMED INSTRUCTION, (5) TELEVISED INSTRUCTION, (6) STUDY SKILLS CENTERS, AND (7) COOPERATIVE INTERCOLLEGIATE PROGRAMS. (WO)

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NEW DIRECTIONS FOR INSTRUCTION IN THE JUNIOR COLLEGE

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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New Directions for Instruction in the Junior College

A Report of a National Conference Sponsored by
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the American Association of Junior Colleges
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July 15-17, 1964

Edited by
B. Lamar Johnson

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March, 1965

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PREFACE

The National Conference on New Directions for Instruction in the Junior College largely resulted from suggestions made in a report of a national survey of the utilization of junior college faculty services. The author of the report observed that "A variety of promising innovations have been identified in junior colleges in many sections of the nation. The opportunity to exchange experiences and share findings is needed, not only among neighboring junior colleges, but also nationally. . . . Junior colleges can also desirably borrow suggestions and plans from other units of education."[1]

The conference was attended by more than 200 persons from 15 states, the District of Columbia, Canada, and the Virgin Islands. It provided an opportunity for junior college administrators and other staff members "to exchange experiences and share findings." Presentations on developments in four-year colleges and universities contributed much to the meeting. These included reports from Monteith College of Wayne State University, Raymond College of the University of the Pacific, the Small College at California State College at Palos Verdes, the United States Air Force Academy, and the University of California at Santa Cruz. Papers presented by Winslow R. Hatch ("New Directions for Instruction in Higher Education") and B. Lamar Johnson ("New Directions for Instruction: A Need and a Proposal for the American Junior College") also considered developments in senior institutions.

No single pattern characterizes the "new developments for instruction" reported at the conference, for varied practices and plans were described. These included programmed instruction, the use of television in teaching, and a description of a multiplicity of "new directions" in nursing instruction. Attention was given to reports from experimental senior institutions—and their relevance to junior college programs.

It is hoped that the conference proceedings will be of value to junior college faculties, and that this report may stimulate innovation and experimentation in instruction.

The National Conference on New Directions for Instruction in the Junior College is the eighth in a series of summer conferences jointly sponsored by the University of California at Los Angeles and the Accrediting Commission for Junior Colleges of the Western Association of Schools and Colleges. The American Association of Junior Colleges has joined in sponsoring the last two of these conferences: 1963, "Establishing Junior Colleges," and 1964, "New Directions for Instruction in the Junior College."

Appreciation is expressed to those who presented papers, and, for editorial services of William Harper, Director of the Office of Public Information of the American Association of Junior Colleges.

B. LAMAR JOHNSON

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[1] B. Lamar Johnson. *Islands of Innovation. Occasional Report No. 6, UCLA Junior College Leadership Program* (Los Angeles: School of Education, University of California, 1964), p. 14.

SECTION I

New Directions

WINSLOW HATCH

INSTRUCTION IN HIGHER EDUCATION

There are two dimensions in educational trends and developments—one horizontal, the other vertical. The horizontal dimension is usually explored by examining developments in essentially the same plane of analysis. The reports studied in this plane and at this level are typically descriptive and anecdotal. The vertical dimension is discovered by asking whether there is not a better reason for emulating a new development or trend than because it is new and different. The better reason would appear to be evidence that the innovation produces *better learning.*

There is a body of *research on learning theory and the conditions of learning* which identifies the achievement that is the real test of the development. It also identifies, in advance, the test the institution will have to make of the innovation. By such questioning, the innovating institution is alerted to the need to assign to the project teachers whose scholarship is proven and whose ability to direct student learning has been demonstrated. The commitment of students and their critical facilities have to be similarly appraised and found adequate if the innovation is to succeed.

The critical examination that begins with an appraisal of the developments and their implications for learning provokes a second question and leads to other research that is peculiarly relevant to planning for innovation. This is research that enables the institution to determine whether the innovation will, in fact, result in better learning. This research has been done by behavioral scientists, and deals with *the criteria by which one can determine the quality of an institution, and hence the quality of its teaching and learning.*[1]

If the development under study survives this second test and meets the necessary qualitative conditions, a last question must be asked and additional research on the *climate of learning* studied.[2] This is the ultimate test and if it is made first it can save the institution much time and possibly unhappy consequences. If the conditions suggested by this research can be met, the innovating institution will know that it can proceed with confidence. If not, it will know that its chances for success are poor. It can, of course, always create such a climate, but it should be prepared to pay the price for such an approach.

Exploitation of the vertical dimension in trends or developments has a final and a critical advantage in that it suggests some of the strategies of innovation. For example, quality is a prepossessing objective for which enthusiasm can be generated when there is no great interest in the development itself or in its implications for learning.

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[1] Winslow R. Hatch. *What Standards Do We Raise? New Dimensions in Higher Education,* No. 12 (Washington, D.C.: U. S. Government Printing Office, 1963).

[2] *Ibid.*

The *climate of learning* is even more attractive in most situations and appeals to most faculties, administrators, and students. Certainly few planners would admit that they would not like to do something about it or cannot improve it.

A TWO-DIMENSIONAL ANALYSIS

In this statement I shall try to make a two-dimensional analysis by plotting first the developments at the horizontal level, and then plot the research uncovered in a vertical penetration. Such an approach may reveal research support that is not only impressive but very helpful in weighing critical problems which, if neglected, could result in program failure. While the improvement of instruction can be attacked at any one of several levels, it it advisable to understand all of them. Let us start with the matter of trends looking to the improvement of instruction. While I am quite prepared to speak for myself (as I have in the *New Dimensions* series), it might be more helpful to outline some of the observations of Samuel Baskin and his collaborators in their book which will appear this spring. The major trends identified are:

1. Independent study.
2. Great sophistication in independent study.
3. Disposition to break up the massive college into smaller colleges.
4. Disposition to loosen the curriculum through advanced placement, credit-by-examination, and the challenging of prerequisites.
5. Programmed learning and computer-based learning.
6. Television and the mechanically supported lecture.
7. Better management of learning spaces, including not only classrooms and libraries, but living facilities as well.

Now, what are Baskin and his associates saying about their *New Developments*[3] and what do I feel impelled to say about my *New Dimensions?*[4] It is that we may have done a disservice if there is not more to new developments than what appears in a catalog of them. Certainly, they are not good because they are new or because they are developments. The question is, are they better than something else? This brings us to the second level of analysis, a deeper and presumably a more fundamental and critical level.

This better something must be teaching that results in better learning. And what is better learning? It is based on research and it has been tested in many classrooms. In an impromptu concensus, Cagñe, Tyler, and McKeachie[5] have come to the same conclusions through their own research and on the research they have reviewed.

Good learning, according to Tyler, is brought off "when the learning reflects that which the learner learns, that which he is thinking, feeling, or doing" when, in McKeachie's words, "the learning is active rather than passive." (This is not news, but it is helpful in appraising trends with certain requirements in mind.)

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[3] Samuel Baskin, Editor. *Higher Education: Some Newer Developments* (New York City: McGraw Hill, 1965).

[4] *New Dimensions in Higher Education*. Series edited by Winslow R. Hatch (Washington, D.C.: U. S. Office of Education, 1960–).

[5] Winslow R. Hatch. *Approach to Teaching. New Dimensions in Higher Education*, No. 13 (Washington, D.C.: U. S. Government Printing Office, 1964). In press.

"The learning of principles as opposed . . . to rote learning" is endorsed as are the aspirations of teachers and students. To learn well, the student must "set high standards of performance for himself . . . high but attainable," according to Tyler. McKeachie flatly states that "we can teach students to enjoy learning."

In summing up, what do they find good teaching and learning to be? It is "guided discovery," according to Gagńe, "problem solving," according to Tyler, and "problem-oriented instruction," according to McKeachie.

It can be concluded from this evidence that a trend can be emulated when it produces better teaching and learning.

RESEARCH ON QUALITY

We are often more disposed to act on research on *quality*. Actually, quality or excellence is a preoccupation of our time. The thesis in *What Standards Do We Raise*[6] is that institutional quality can be measured by good learning, tested by research on quality. Efforts in trying to derive criterion of excellence from this research have received respectful attention, have provoked much introspection, and may have done more to move people and institutions to act to improve their teaching than thirty years of research on learning. As a tactician, I recommend this approach.

There is another related body of research that is apparently even more persuasive. It is also more fundamental and, best of all, it provides us—at least in theory—with additional indicators of how good we are, how good our teaching is, and hence how ready we are for innovation. This research deals with the characteristics of students and teachers, and hence of institutions associated with educational effectiveness, or "high productivity," or "impact." These characteristics, in brief, are:

1. *Intellectual orientation.* In pointing out the importance of this quality, it should be made clear that less well endowed students and institutions are not exempted, nor is the technical student or college, or any level of college or of student.
2. *Intellectual initiative and responsibility.*
3. *Critical facility,* meaning demonstrated gains in thinking.
4. *Creativity—originality—imagination.* On this point, the research says that our students are as likely to be less, rather than more, creative after two or four years of college.
5. *A nonstereotyped or unorthodox state of mind.* Here it has been shown that an orthodox faculty produces orthodox students, orthodox students grow into orthodox citizens, and orthodox citizens act as though they have not been exposed to higher education.
6. *Sensitivity to the problems of others,* the last attribute, protects us from the ready criticism that effective institutions are socially irresponsible. Research clearly indicates that "productive" students and teachers are particularly sensitive to the needs of others and, hence, of society. This is tactically very helpful because it makes it clear that effective teachers and institutions cannot be easily dismissed as intellectual snobs.

This research says that a trend, that learning, that talk about quality are not valuable unless they touch the spirit of the place. It suggests we must be cognizant of learning theory if we are to innovate and explore new trends and developments.

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[6] Winslow R. Hatch. *What Standards Do We Raise? New Dimensions in Higher Education,* No. 12 (Washington, D.C.: U. S. Government Printing Office, 1963).

This examination reveals that the essence of independent study, of honors, the reason for flexibility, is *student inquiry*. It is the missing ingredient in much teaching and in student study.

The generic term most frequently used to encompass *discovery, guided discovery, problem solving,* and *problem-oriented instruction,* is *inquiry.* In a *climate of learning,* it is cause, product and vehicle.[7]

SOME TACTICAL CONSIDERATIONS

If persuaded that good teaching is inquiry, we should, as teachers wedded to research and/or scholarship, be ourselves. Many of us have foregone this because we have been told by our critics that we don't know our business. But we do! Who, for example, is going to give us lessons on what is involved in inquiry? If we don't know what inquiry is, whom shall we blame? Why do junior colleges defer to the state colleges, and why do the state colleges defer to the universities? Do state colleges provide better instruction than junior colleges? Why do the several layers in higher education spend so much time jockeying for position?

We cannot, seemingly, be content with improving our own courses. We must make over the university, the college, or the curriculum, or introduce, and preferably direct a new development. Unless it touches our teaching and improves student learning, what have we accomplished? In saying this, I am not picking on the junior college. Actually, Samuel Baskin and I have been saying that we should perhaps forget his *New Developments* and my *New Dimensions* and get back to the essentials. I am acting on my own advice, because the next *New Dimension's* piece will be entitled *Approach to Teaching,*[8] and will concern itself primarily with the classroom.

Were I to identify the fundamentals, whether they appear in somebody's trends, theories, attributes, or climates, I would suggest that answers to the following questions would meet the tests suggested by the research to which I have alluded:

1. Why don't we start worrying about the *climate of learning,* not only in our classrooms, but in our students' studies and living rooms; what about the learning-living climate? Why not experiment with a Learning-Living Center?

2. What about the academic immersion of our commuting students? Where do they congregate when not in class, and what is being done to make this place thought-provoking? How fine and how subtle are these accommodations?

3. If we need to bolster our egos and confidence, why not import a few free-wheeling scholars who are not afraid to be themselves? There are such scholars in every community we serve.

4. If we see merit in independent study, advanced placement, credit-by-examination, and we see lack of merit in remedial instruction, why don't we admit it and do something we can manage? When students are more

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[7] *Ibid.*, pp. 20–22.

[8] Winslow R. Hatch. *Approach to Teaching. New Dimensions in Higher Education,* No. 13 (Washington, D. C.: U. S. Government Printing Office, 1964). In press.

heavily involved in their own education, they can be encouraged to *acquire* or *inquire.*[9] If we are honest with ourselves we should recognize that such inquiries as junior colleges can stimulate will not compare favorably with what senior colleges can achieve. That which could be done by exploiting student inquiry in junior colleges could, however, be very great and very impressive. You have many students who cannot write or read well, or do simple sums, or speak a language. Since they could learn to do all these things, why not try to persuade them to?

5. If in introductory courses we were to make the same distinction between the skills of acquiring and of inquiry, and were to involve our students in a type of independent study in which they acquire the routine facts by their own efforts, can we doubt—with all the extras the instructor can now add—but that our students might not be more than a match for those students taught elsewhere who will not make the same commitments?

6. Finally, there are some lessons in general education that we might consider. Despite the sharp things said about it today, and the mean things done to it and in it, we can still conclude, I think, that it is sound in theory.

The following lessons are pertinent.

a. General education should reflect both a specialized and a generalized scholarship; the teachers in the program should be scholars who have done, and are doing research, who understand it and feel its excitement. They must be able to reflect in their teaching how a scholar thinks and feels.

b. The instructors of general education courses should not cut their professional roots but retain membership in departmental faculties; they should teach advanced courses and do research; such teachers should not be set apart in a special general studies faculty in a special college but maintain their membership in a liberal arts or university college.

c. The methods of study and of teaching employed in general education programs are receiving more and more attention. The statements currently being made are that the primary emphasis in these programs is on scholarly or critical methods, on "inquiry," "common inquiry," "joint inquiry," or "student inquiry." Another manifestation of this development is to be seen in the increased attention given to independent study.

d. The new emphasis on inquiry, on independent study and on honors in general education has not led to the sacrifice of content, but to its enhancement. When students accept a larger responsibility for the acquisition of information, the teacher is freed from the presentation of routine fact and is able to supply more facts as well as examine them.

e. The need for the integration or synthesis of knowledge should be accommodated in a device known as "conceptual" integration; such integration appears to be the kind sought in those programs that existed long enough to evolve to this level of sophistication.

f. The new mode in general education appears to be vertical rather than horizontal.

g. More and more emphasis is being placed upon the competence of teachers as against the structure of courses and of curricula.

h. Interdisciplinary courses are receiving more attention in general education. This development is deriving its support from a substantial trend toward such instruction. This trend is to be seen in the 4-2 or the 3-3 program, independent study, the emphasis on principles as against fact, on the scientific as against the technical; also in the requirements of inquiry and of comprehensive examinations.

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[9] Winslow R. Hatch. *What Standards Do We Raise? New Dimensions in Higher Education*, No. 12 (Washington, D.C.: U. S. Government Printing Office, 1963), pp. 20–22.

i. Even though the primary emphasis in general education programs is upon teaching, the administrators of these programs need to be particularly alert to the degrees acquired by the faculty, and their competence in research. In their absence the faculty and the program become vulnerable to criticism. When such programs come under attack, the lack of degrees and of a sustained research output breeds an internal insecurity that may cause the program to collapse from within.

j. General education programs should not be introduced by administrative fiat or by a faculty—including the professional departments—that lacks intellectual conviction about the need for general studies. Without such commitment and support, the program can be brought down with a change in administration or other crisis.

A close reading of the above conclusions (which developed independently[10] of any of the developments mentioned, or of any of the research findings reported) affirms much that has been said about the critical role of the learning process, of quality, and of the climate of learning.

I have been able here to state a thesis, a thesis based on research. The research referred to is that assembled in the Clearinghouse of Studies on Higher Education, which research has been reviewed from time to time in *New Dimensions in Higher Education.* The distillation presented here may dull rather than stimulate, but I would attempt nothing less than the most critical presentation of which I am capable because yours are critical problems.

In conclusion, I would simply observe that the major trend, the sum of all the trends, appears to be an individualization of learning—even as mass education takes over. This individualization is met in the trend toward (1) independent study, including honors, the trend toward (2) greater sophistication in such study; also the disposition to (3) break up the massive college into small colleges, and to (4) loosen the curriculum through advanced placement, credit-by-examination, and through the challenging of prerequisites. Even programmed learning, and computer-based learning may be thought of as individualizing learning. Television and the large lecture supported by projectors of all sorts may be thought of as devices that enable one to buy the time required if more students are to be provided with more opportunities for study in small groups.

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[10] Winslow R. Hatch. "General Education and University Reform," *Improving College and University Teaching* (Summer Issue, 1964; Corvallis, Oregon: Oregon State University Press).

B. LAMAR JOHNSON

A NEED AND A PROPOSAL FOR THE AMERICAN JUNIOR COLLEGE

The one certainty in life—in addition to death and taxes—is change. All signs point to an acceleration of the pace of change in the future. The rate and direction of change are conditioned by rising populations and the expansion of knowledge—accompanied by advances in science and technology and in the mass media of communication—and by the increasing mobility of peoples of the world.

Cotton is picked, bank checks sorted, and oranges and student examinations graded by mechanical means. Computers are being used to diagnose illness for the physician, read envelopes for the mailman, and retrieve information for the scholar. Computers are being "taught" to translate languages, play chess, compose music, write poetry, and transcribe speech. Through the use of critical path techniques, computers are being used to construct buildings and, in a sense, to establish junior colleges. Telestar is opening new vistas for international television; one-hour transcontinental plane trips are being planned; and interplanetary travel is in prospect.

CHANGE IN EDUCATION

Yes, change is here, and rapid change is in the offing. And historians say that periods of social transformation are also periods of educational reform.

With the sharp expansion of enrollments at all levels, with the post-Sputnik alarm over school and college inadequacies, with rising costs of concern to taxpayers, there is great pressure for increased efficiency and improvement in education.

Yet, change in educational traditionally takes place at a slower rate than in most other areas of American life. In studies of the adaptation process, Mort and his associates in the late thirties found that:

> ... change in the American school system comes about through a surprisingly slow process.... Between insight into a need (for example, identification of school children's health problems) and the introduction of ways of meeting the need that is destined for general acceptance (for example, health inspection by a school doctor) there is typically a lapse of a half-century. Another half-century is required for the diffusion of the adaptation. During that half-century of diffusion, the practice is not recognized until it has appeared in 3 per cent of the systems in the country. By that time, fifteen years of diffusion—or independent innovation—have elapsed. Thereafter, there is a rapid twenty years of diffusion, accompanied by much fanfare, and then a long period of slow diffusion through the last small percentage of school systems.[1]

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[1] Paul R. Mort. "Studies in Educational Innovation from the Institute of Administrative Research: An Overview." Matthew B. Miles, editor. *Innovation in Education* (New York: Bureau of Publications, Teachers College, Columbia University, 1964), p. 318.

This lapse of time seems long indeed when we recall that a manned rocket sped into outer space only 58 years after the first successful flight of the Wright Brothers. A variety of data suggest, however, that the rate of diffusion in education has accelerated. A recent survey of the use of programmed instruction in school shows:

> ... that 11 per cent of school systems sampled were using some form of programmed instruction. If we consider Skinner's machine, available in 1954, to be the "first authentic introduction of a successful invention," seven years have elapsed; the prediction from Mort's average curve would have been 2 per cent diffusion in this period of time.
>
> According to a report in Saturday Review (February 16, 1963), 46 language laboratories were known to have existed in secondary schools in 1957; this included approximately .2 of 1 per cent of the total secondary schools. Five years later, over 5,000 schools (approximately 17 per cent of the total) had such installations. Here again the Mort predictions would have been for less than 2 per cent diffusion in the same period of time.
>
> ... The first introduction of the teacher aide innovation (in which teachers are assisted by subprofessional personnel who perform routine duties such as record keeping) was made in Bay City, Michigan, in 1952. Data from a national sample of elementary and secondary schools indicated that 9 per cent of elementary schools and 18 per cent of secondary schools were using teacher aides during 1960–61. The Mort prediction would have been for about 2 per cent diffusion for this period....
>
> An example from the area of curriculum materials suggests a similar acceleration. The Physical Science Study Committee was formed in 1956; the first text was available in 1957; according to Mayer ... the PSSC materials were in use in nearly 20 per cent of American schools by 1961.[2]

We have noted that we are living in an era of change and that continuing change is inevitable. Although changes in education occur at a slower rate than in many other segments of life, there is evidence that the rate of diffusion of new ideas and practices in education is speeding up.

CHANGE IN THE JUNIOR COLLEGE

But what about the junior college? Here is a sharply expanding institution which is repeatedly referred to as "the most dynamic institution in American education." The dynamic quality of the junior college is in itself the product of change, change in thinking about the responsibilities of higher education and change in the manpower needs of the nation. Communities and states throughout the country are looking to the junior college for education that will prepare men and women for new kinds of semiprofessional and technical jobs. Retraining, made necessary by changes wrought by automation in business and industry, is now considered an important function of the junior college. Demand for college experience by greater numbers of young people dictates expansion of programs leading to transfer to four-year colleges. The need to strengthen general and adult education, and to provide special services to the community, add to the weight of responsibility placed on the junior college.

Two-year colleges currently enroll one million students. By 1975, it is conservatively estimated that this will be expanded to two million; twenty-five to thirty new colleges will be required each year. In addition, existing institutions must expand sharply.

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[2] Miles B. Matthews. "Educational Innovation: The Nature of the Problem." *Innovation in Education* (New York: Bureau of Publications, Teachers College, Columbia University, 1964), pp. 6–7.

If the junior college is to meet the responsibilities which are being thrust upon it, and if it is to respond to demands of taxpayers for the highest efficiency of operation, it must be in the forefront in adapting to change. This can justifiably be expected of this relatively young institution, comparatively unhampered by tradition.

Unfortunately, however, our needs and expectations are not being realized. Edmund J. Gleazer, Jr., Executive Director of the American Association of Junior Colleges, observes:

> It is my impression that community colleges in general have tended to stay well within the boundaries of current educational practice and procedure. Frequently described as flexible, dynamic, new and responsive, the junior college does not often actually fit that description.[3]

Glaezer's impressions were confirmed for me in a survey which I made of the utilization of junior college faculty services. In seeking to identify innovations and experiments, I visited 28 junior colleges in 12 different states, and conferred or corresponded with representatives of 80 different colleges. At the conclusion of my survey, I asserted:

> ... it is clear that junior colleges, in general, are doing little experimentation in the effective utilization of faculty services. It must be recognized that most of the colleges included in the survey were selected because they had been known to engage in some innovating practices, but even among these institutions most of the practices reported are found in a scattering of colleges only.
>
> The general picture is one of significantly less experimentation than would be expected, or certainly hoped for, in an institution which is often referred to as "the most dynamic unit of American education."[4]

Although it is not my purpose to summarize the report of my survey, I will quote a few sentences which have relevance:

> The times in which we live demand bold and imaginative thinking at all levels and in all aspects of education. These demands, however, particularly confront the junior college—a sharply expanding institution which must clearly assume major responsibility for providing two years of college in the home communities (that is, within commuting distance, except in sparsely settled regions) of all high school graduates....
>
> Large opportunity lies ahead in charting as yet uncharted seas in the bold and imaginative development of unique plans for a unique institution, the junior college.[5]

But how can we develop bold, imaginative and unique plans? We can, of course, borrow from other units of education, and we can exchange experiences and findings at conferences. But this is obviously insufficient.

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[3] Edmund J. Gleazer, Jr. "Establishment: A Trend and an Opportunity for the American Junior College." *Establishing Junior Colleges. Occasional Report No. 5, UCLA Junior College Leadership Program* (Los Angeles: School of Education, University of California, 1964), p. 14.

[4] Lamar B. Johnson. *Islands of Innovation. Occasional Report No. 6, UCLA Junior College Leadership Program* (Los Angeles: School of Education, University of California, 1964), pp. 12–13.

[5] *Ibid.*, pp. 14–15.

THE EXPERIMENTAL COLLEGE

In the recently published volume on the phenomenon and process of change in education, Miles discusses the strategy of change, and suggests that the "creation of new structures" contributes to innovation. Conversely, he observes that certain types of strategy seem less effective, including "those which attempt to use only existing structures, and are thus hamstrung by the status quo."[*]

We note that new developments in education have frequently been advanced in experimental schools. Pestolozzi, Montessori, and Dewey, for example, established schools in which to try out and demonstrate their theories.

Experimental institutions have also had a notable role in higher education. Let me call the role of a few of these: Antioch, Bard, Bennington, Black Mountain, the General College at the University of Minnesota, the Meiklejohn Experimental College at the University of Wisconsin, Sarah Lawrence, Stephens. Two of these, Black Mountain and the Meiklejohn College, are no longer in existence. Some have ceased to be experimental. Others continue to be experimental in the finest sense of that term.

As I listed experimental colleges, I quite consciously omitted one institution. I refer to New College. This omission was due to my fear that you might not know which New College I had in mind. I shall mention three possibilities.

New College established at Teachers College, Columbia University, in 1932, had a seven-year existence during a period of national depression. This college, with a maximum enrollment of 360, had a five-year curriculum leading to the master's degree. It featured individual guidance, independent study, extensive experience with children, and work—in industry or on a farm.

A second New College has just completed its fourth year as a self-contained unit within Hofstra University. Unlike New College of the thirties, the Hofstra college has a one-year rather than a five-year program. It is solely for freshmen and aims to offer them an intellectually challenging and cohesive year which prepares them for advanced work at Hofstra or at other colleges. New College is for commuting students but plans to offer benefits ordinarily available only to those in residential institutions.

But there is yet a third New College, to open at Sarasota, Florida, next September. It will feature seminar and tutorial instruction, a house plan, and an 11-month calendar which makes it possible to earn a Bachelor of Arts degree in three years.

It may be significant that each of these institutions chose to take the name New College. The Sarasota college has announced its intention of retaining the name New College permanently—as a symbol of its continuing commitment to innovation and experimentation.

As a matter of fact, commitment to "the new" is by many regarded as the bench mark of the experimental college. Marjorie Carpenter of Stephens College really asserts a conviction as she asks:

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[*] Matthew B. Miles. "Innovation in Education: Some Generalizations." *Innovation in Education* (New York: Bureau of Publications, Teachers College, Columbia University, 1964), p. 649. See also Winslow R. Hatch, *The Experimental College. New Dimensions in Higher Education*, No. 3 (Washington, D.C.: U. S. Government Printing Office, 1960).

Is the clue then to a genuinely experimental college a faculty which can be fired with the idea of passionately striving for the new? Is the key for the administration, now pathetically bogged down with financial worries, a shift to this same passionate striving for the new?[7]

Rudolph suggests that Antioch College, founded by President Arthur E. Morgan in 1921, was perhaps the first of what we refer to as the experimental colleges.[8] It was during 1921, also, that W. W. Charters initiated studies which were to become the basis for curriculum and other developments at Stephens College.

During the late twenties and the early thirties, there was marked activity on the experimental college front. In 1928 Meiklejohn launched the Experimental College at the University of Wisconsin, and Sarah Lawrence opened. Bennington was founded in 1932. This was also the year that the University of Minnesota launched its General College, Teachers College its New College, and Chicago its The College. One year later, in 1933, Black Mountain College was founded in the hills of North Carolina, and in 1935 long-established St. Stephens College became Bard College, which was known as Columbia's Hudson River Experimental College.

Following this notable activity and development there was, during the 40's and 50's, a period of relative quiescence on the experimental college front. There was a war to be fought, G.I.'s to be educated, and planning to be done for future demands for higher education.

Now in the 60's there appears to be a resurgence of interest in experimental colleges. Several have been founded and others are planned.

To the present, however, the junior college has largely remained untouched by this upsurge of experimentation. The junior colleges have stood separate and apart from the experimental colleges, except to adopt some of their pioneering developments.

A number of current developments and trends were discussed at the Colloquium on Experimental Colleges held at Wakulla Springs, Florida, April 5–8, 1964, under the joint sponsorship of Florida State University and the Southern Regional Education Board. In attendance were representatives of ten invited institutions: Antioch, Florida Presbyterian, Michigan State University, Monteith College of Wayne University, New College at Sarasota, Parsons, Stephens, University of California at Santa Cruz, University of Michigan at Dearborn, and University of the Pacific. Also present were invited consultants and representatives of foundations.

On the assumption that the institutions represented in the Wakulla Springs Colloquium are representative of present experimental colleges, I would like to report ten trends noted at the conference and also to point out six realities in American life and education which were neglected.[9]

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[7] Marjorie Carpenter. "The Role of Experimental Colleges in American Higher Education Today." Address at Colloquium on Experimental Colleges (Wakulla Springs, Florida, April 5, 1964).

[8] Frederick Rudolph. *The American College and University* (New York: Alfred A. Knopf, 1962), p. 474.

[9] Materials regarding the Wakulla Springs Colloquium in the succeeding pages are adapted from B. Lamar Johnson. "Behold You Have Created a New Thing: A Conference Summary and Critique." Address at Colloquium on Experimental Colleges, Wakulla Springs, Florida, April 8, 1964.

Among the trends I observed were these:

1. The colleges represented had relatively small enrollments or were divided into manageably small units. The emergence of separate experimental entities within large institutions impressed me as much as any single development. I refer to the clusters of small colleges at the University of the Pacific and at the University of California at Santa Cruz, to Monteith College of Wayne University, to the plan for instruction in resident hall units at Michigan State University, and to the house plan at Stephens College. Repeatedly during the conference it was suggested that separate colleges or other units can form a basis for innovation, even within a large and complex university. In the words of a slogan at the University of the Pacific, "We grow larger by becoming smaller"—a concept which is echoed at the University of California, at Santa Cruz, where the goal is "to seem smaller as it grows larger."

2. Most of the colleges represented at the conference were young institutions, which suggests the resurgent interest in experimental colleges to which I referred. It should be noted, however, that Antioch and Stephens have "been in the business" for several decades.

3. Eight of the ten are residential. Only Monteith College and the University of Michigan at Dearborn are primarily commuting institutions.

4. These experimental colleges emphasize the liberal arts or general education. Only the Dearborn campus of the University of Michigan highlights technology and preparation for earning a livelihood—though with a recognition of liberal arts.

5. With a single exception—the Dearborn campus of the University of Michigan—the colleges participating in the conference have four-year programs. The Dearborn campus—adjacent to Henry Ford Community College—offers only the junior and senior years and graduate work.

6. The colleges tend to have selective admission policies—and many of them are very selective. Only Parsons encourages the admission of students with low achievement. Factors of economic selection operate for most and perhaps all of the colleges.

7. Experimental colleges emphasize independent study, both as a method of instruction and as a goal of education. It was notable that independent study was planned for all students at most of them—not just for honor students. Institutions which stress independent study include Antioch, Florida Presbyterian, and New College.

8. The programs tend to be student-centered. Reference was made to content-centered, library-centered, and faculty-centered offerings. Repeatedly, however, the discussion returned to the individual student as the focus of the experimental college. Flexibility and individualization of both content and rate of learning were commonly reported.

9. Experimental colleges stress the importance of evaluation in appraising both the achievement of the individual students and the effectiveness of the educational program, in whole or in part. Reported during the conference were the responsibilities of the "professional assessor" at New College, those of the Director of Program Development and Research at Antioch, and those of the Director of Institutional Research at Michigan State University. Associated with evaluation are proposals for eliminating grades and credits. A good deal is being done in granting credit by examination.

10. The library occupies a position of special importance in experimental colleges. Varied plans were reported and suggestions advanced: special college and house libraries; completely open shelves and ready access to books twenty-four hours a day; the library as a center of varied resources of learning—both books and audio-visual materials; the provision of carrels or offices for independent study by students; the use of the library—in totality, if you will—as a textbook for teaching; the development and use of systematic library assignments for purposes of substantive teaching and also to provide a thorough and comprehensive grounding in the process of using the library as a tool for learning (specifically at Monteith College); the fusion of the library staff and the teaching faculty into a single instructional staff, epitomized, perhaps, by the observation that the classroom flows into the library and the library flows into the classroom. The plans that are used or contemplated are varied, indeed. Unanimous agreement was reached, however, on the assertion that the library can and must have a notable role in the experimental college—a role based up on the particular goals, organization, and program of a specific institution.

An examination of these trends reveals a relevance to certain facts of life and of education: the fact of individual differences, the reality of individual responsibility, and the necessity for evaluation. Nevertheless, there was at the Wakulla Springs Conference a failure to recognize a number of realities in Amercian life and education which should condition the function and operation of at least some experimental colleges. I should like to refer to six of these neglected realities:

1. The commuting college. The commuting college and university must increasingly be recognized as an emerging pattern for much—and I venture to suggest most—of American higher education. The student lives at home. He comes to campus for his classes and for some of his studying. Some bewail this situation, but it is a reality. For millions of youth the choice is and will be a commuting college or no college at all. This reality was given but little attention at Wakulla Springs, though Monteith College of Wayne University is primarily a commuting college, as is the Dearborn campus of the University of Michigan which will soon add residential units.

2. Technological aids to teaching. In an age of technology, education has an opportunity to use aids to teaching and learning that were undreamed of a generation ago. Television and electronic facilities for listening and viewing are representative developments which make imperative the examining and re-examining of the organization and processes of teaching. Technological aids may permit economies (including large group instruction in appropriate situations) which will make possible individualized and personalized teaching. It has also been suggested that such developments as television may result in decentralized, and some would suggest disintegrated, campuses. Technological aids are central in much of the planning at the University of California at Santa Cruz. Nevertheless, the reality of technological aids was largely neglected at the Florida colloquium.

3. The junior college. One of every four students entering college attends a junior college. Two-thirds of the freshmen and sophomores in California are attending junior colleges—and other states are projecting similar ratios. The Wakulla Springs Conference was held in a state where the junior college

has had its most notable development during the past five years, where a university is opening to offer only upper division instruction and graduate work. The conference was held during a year in which the Educational Policies Commission and Secretary of Labor Wirtz have urged the upward extension of free public education through the sophomore year of college. The trend is clear. The junior college will increasingly assume a larger share of the responsibility for meeting a variety of educational needs. And yet at Wakulla Springs the experimental college was considered almost entirely within the context of a continuing four-year period in a single institution. No junior college was represented—for, to the best of my knowledge, no experimental college is a junior college.[10]

4. Education for employment. There is increasing demand for technologically competent men and women. Post-high school education—frequently of less than four years—to prepare "semiprofessional" or "middle level" personnel—is being required for employment in the age of automation. The realities of technological training and education for employment were almost neglected at Wakulla Springs.

5. The "open door" college. As our nation presses toward the democratic ideal of educating each individual to the level of his optimum potential, it is clear that opportunity for education beyond high school must be expanded. To this end, the "open door" college is becoming a reality, for most public junior colleges admit all high school graduates, and, in some states, applicants over eighteen who can benefit from the experience. Experimental colleges, however, are typically highly selective in their admissions policies. The reality of the "open door" college was, indeed, neglected at Wakulla Springs.

6. Implications of the experimental college for American higher education. The significance of experimental colleges rests only in part on the effect they have on the lives and thinking of those who attend them. Only a minor percentage of the college students of our nation can attend such institutions. Their importance must extend far beyond their alumni. The experimental college has an opportunity and, indeed, an obligation to take leadership in American higher education. This is a responsibility which was, however, largely neglected at Wakulla Springs. Evidence of this is suggested by the minimal attention given to realities of central importance in American higher education: the commuting college, technological aids to teaching, the junior college, education for employment, and the "open door" college.

A RECOMMENDATION

In the spirit of the opportunity and of the need which lies before us, I would like to make the following recommendation:

That there be established in various sections of the country experimental junior colleges committed to leadership in innovation and experimentation within the framework of the role, functions, and organization of the community junior college.

The experimental colleges should be representative of, and responsive to, the mainstream of American higher education. They must recognize the realities of the commuting college, of technological aids to teaching, of education for employment, and of the "open door."

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[10] Stephens College, which was represented at the conference, has recently become a four-year college, though it does continue to offer two-year programs and grant the Associate in Arts degree.

> . . . Particularly . . . needed are imaginative proposals which are directly relevant to the unique characteristics of the two-year college. These might include, for example, new ideas for using community personnel and facilities; innovations in organizing and providing remedial teaching of the type so widely required in the "open door" college; and proposals for completely new class schedules and college calendars adapted to the needs of the community college.[11]

Experimental junior colleges might be sponsored by states, counties, local school districts, individual colleges or cooperating groups of colleges, foundations, or junior college associations. One possible type of sponsorship is suggested by a recommendation from the staff of the Master Plan for Higher Education in Illinois that "A suitable sum be appropriated to conduct a study to determine the desirability, need and potential effectiveness of a new state-supported senior level college devoted exclusively to educational experimentation for mass education."[12]

Experimental colleges may be newly founded or long-existing colleges undergoing reorganization. An experimental college might be organized as a separate entity within a large institution, such as a large junior college.

CONCLUSION

New directions for instruction in the junior college will obviously emerge from no single source. I have urged the establishment of experimental junior colleges, and I have pointed out the values of borrowing from other units of education and of exchanging findings and experiences between and among junior colleges.

On other occasions I have suggested that junior colleges appoint vice presidents in charge of heresy. Advanced in a somewhat different context in a lecture by Philip H. Coombs at UCLA in 1960,[13] this proposal would provide a staff member—with no administrative responsibility—whose duty it would be to keep abreast of national developments and to initiate plans for exploiting them at his own institution, as well as to develop completely new plans for local use and application. Our vice president would be a "dreamer." He would attend conferences and assemble "far out" proposals. He would needle administrators and his faculty colleagues and, in turn, be needled by them. He would study the findings of research and analyze their implications for his college. He would, in short, be a harbinger and instigator of change. We need to be daring in junior colleges. Why not a vice president in charge of heresy?[14]

And—who knows? If my recommendations are followed, we may soon have a national conference and organization of vice presidents in charge of heresy in experimental junior colleges.

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[11] Johnson, *op. cit.*, p. 14.

[12] Illinois Board of Higher Education. *Staff Recommendations for a Master Plan for Higher Education in Illinois* (Springfield, Ill.: the Board, 1964), p. 23.

[13] Philip H. Coombs. *The Technical Frontiers of Education.* The Twenty-Seventh Sir John Adams Lecture at the University of California, Los Angeles, March 15, 1960 (Los Angeles: School of Education, University of California, 1960), pp. 14–15.

[14] See also B. Lamar Johnson, "Islands of Innovation." *Junior College Journal,* Vol. 34, No. 5:9–14 (February, 1964), p. 14.

EDMUND J. GLEAZER, JR.

PREPARATION OF JUNIOR COLLEGE INSTRUCTORS

Students are frequently asked why they enroll in junior colleges. Often they reply, "It was close to home" or "It didn't cost much." There is nothing wrong with these answers. Distance and cost have been well recognized barriers to educational opportunity, and the junior college has helped to alleviate these problems. But I am looking toward the day when students will give superior teaching as a foremost reason for their study at a junior college. (Incidentally, many graduates do give the teaching they received credit for drawing them to junior college.) Many of us have described the junior college as a "teaching institution." Others have said it should be a learning institution, but I am assuming that good teaching has something to do with learning.

We could have a most interesting debate about what characterizes the able teacher, but that is not my intention. Rather I shall affirm that some people can learn to teach and that an inescapable obligation of our profession is to be concerned with the preparation of teachers. But what preparation is required?

There appears to be fairly general agreement that the junior college teacher requires preparation somewhat different from the secondary teacher; there is less agreement on the differences in preparation of junior college and four-year college teachers.

Last year the American Association of Junior Colleges requested the faculties of twenty-five junior colleges to give their views on the preparation of junior college teachers. The twenty-five institutions represented all of the geographic regions of the country, and they were large and small, public and private, residential and commuter colleges. Diversity among the institutions was evident in the range of replies. For example, one small residential junior college in the northeast had this reply:

> ... College, as an institution with a unique and long tradition of service in the liberal arts, sees no difference between the junior college teacher and the teacher in the four-year liberal arts institution. It therefore disapproves of segregating the junior college teacher from other college teachers. It feels that the training for junior college teachers should be the same as the training for any qualified college instructor.

But another institution, a community college, represented the preponderant response in its reply:

> We cannot overemphasize the importance of the attitude of the teacher education institution toward the preparation of junior college teachers. If a teacher education institution looks upon the preparation of junior college teachers as a stepchild among

> more worthy siblings, such as research, administration, and university teaching, the setting is not conducive to the most effective development of junior college teachers. The most wholesome environment is one where junior college teaching is considered a worthy occupation in its own right. . . . Because of the diversity of a fully developed junior college program and the necessity for its sensitivity to community needs, junior college teachers should understand the functions of the junior college and the special problems connected with working in them.

The community junior colleges responding to the inquiry seemed convinced that at some point in the preparation of the junior college teacher there is need for experience specifically related to the mission of the community college.

A few national efforts have been made to prepare people to teach in junior colleges. The MA-3 program underwritten by the Ford Foundation has involved thirty-nine universities. Those who initiated the program hoped that promising young people would be identified while still in work at the sophomore and junior level, and that they could be oriented toward the master of arts degree, leading to college teaching. Ostensibly, junior colleges would stand to benefit from these programs.

In a survey of MA-3 programs by the Inter-University Committee on the Superior Student, there is a rather clear indication that the "good" students are encouraged to go after the Ph.D. immediately, and that for reasons of professional advancement, they are directed toward research careers. There is little evidence to date that the universities are giving substantial attention to junior college teaching as a career objective.

A LEGITIMATE AND GROWING CONCERN

Thus the problem of attracting qualified junior college faculty remains a legitimate and growing concern of national consequence. To date, no university or college has organized an institution-wide effort to prepare junior college teachers, although several are actively studying the matter and a notable few have developed limited programs of merit. For the past several years, the American Association of Junior Colleges and its Commission on Instruction have planned a rationale and suggested content for university-centered programs to recruit and prepare instructors for junior and community colleges. These efforts have been based on the premise that (1) there is an urgent requirement for substantial numbers of new junior college teachers in both academic and occupational fields, and (2) specialized programs of recruitment and preparation for persons entering junior college instruction are essential.

With junior colleges expected to enroll from two to two and one-half million students within the next decade, it seems clear that there will be a need for intensive effort to recruit competent new teachers at an accelerated rate. The number of new teachers prepared must far exceed current production if even the most conservative enrollment estimates are valid.

Regarding special preparation, there must be common elements in any program to prepare teachers for college-level instruction. However, it is also apparent that the characteristics of the junior college, particularly the community college offering a comprehensive curriculum, suggest the need for special preparation extending beyond academic competence or technical excellence in nonacademic subjects.

The junior college teacher encounters a wider range of student abilities, motivation, interests, and achievement than is usually found in the lower division of senior colleges and universities. Therefore, the junior college teacher must combine strong guidance ability with academic and teaching proficiency. The junior college instructor works with many students who are misdirected or uncertain of their career goals; with students who require opportunities to repair weak backgrounds; and with those who frequently respond more readily to the practical than to the theoretical.

Further, junior college instructors should be proficient in teaching general education courses. Teachers of vocational-technical subjects must be prepared to translate both occupational and academic subjects for vocational students. Classroom teaching is the primary responsibility of the junior college instructor, in contrast to a responsibility divided between research and teaching for the university professor. The "specialization" for the junior college teacher, therefore, is of a different kind.

FACULTY UNDERSTANDING AND ACCEPTANCE

At the heart of successful junior college teaching lies faculty understanding and acceptance of the diverse purposes of an "open door" institution. Lacking this, the junior college teacher experiences frequent frustrations and discouragements, resulting in a negative effect on the quality and impact of his teaching. The perceptions and attitudes of junior college faculty will inevitably exert a major influence on the course of these institutions and their effectiveness. An understanding of the broad sweep of junior college education during formal preparation is therefore of critical importance. While most junior colleges orient new faculty, this job is becoming difficult with growth in institutions and numbers of teachers. Therefore, preservice preparation should include careful study of the philosophy and nature of the junior college, and the characteristics of its students.

Universities, junior colleges, business, industry, labor, and the professions must find ways to pool their resources for the enhancement of the profession of junior college teaching. Let me suggest two approaches. Both of these involve the finest kind of partnership between the universities and the junior colleges. One places primary responsibility upon the university. The other approach emphasizes the resources of the junior colleges themselves.

1. The American Association of Junior Colleges is encouraging a number of universities to establish programs for the preparation of junior college teachers in academic and occupational fields. While variation among the programs is encouraged, there are certain common elements. They include:

   (a) Teacher candidates drawn from diverse sources, with special emphasis upon new and little used sources, and with special attention to fields of critical shortage.
   (b) Maximum participation by nearby junior colleges in the planning, conduct, and evaluation of the program effort.
   (c) Supervised teaching internships in junior colleges.
   (d) Flexibility of student programming.
   (e) University-wide participation.
   (f) Program content to develop teaching competence in two related subject fields.

(g) Program content related to the nature of the junior and community colleges, student characteristics, and guidance services.

(h) A master's degree in content fields for teachers of academic subjects; a bachelor's degree supported by relevant industrial or other experience for technology instructors.

2. A coordinate approach to preparation of teachers calls for the identification and use of excellent junior colleges as effective environments for the development of teachers. Roger Garrison of Briarcliff College has described these as "centers of infection." Some well established institutions have resources in faculty leadership, plant, facilities, atmosphere, and creative outlook which ought to become centers of leadership for state, regions, or the entire nation. Such institutions could be used as demonstration centers, for experimentation, for conferences, institutes, short-term residence experiences, internships. Present staff could be supplemented with the best talent available in the form of visiting professors, consultants, and visitors from business, industry, or the professions. While assistance can be obtained from other types of institutions, it is unalterable that there are resources within the junior college field itself which must be identified and utilized. Through such activities there can be found leadership among junior college teachers which must then be used in the training of other teachers. These institutions ought to be the "growing edge" of the teaching function in higher education. These institutions should be questioning, experimenting, evaluating. They should be restless in their search for the answers to problems of motivation. They should be alert to and evaluative toward the environment for learning, the effect of a variety of abilities in the classroom situation, relation of general education to technical education, relation of the home and college to learning, relation of guidance and teaching, and a host of other perplexing concerns. In these efforts, junior colleges and universities ought to join in a productive and creative partnership.

There is no more critical problem than the preparation of competent faculty. I can think of no better way to emphasize that point than by quoting from a junior college teacher who participated in a week-long conference of eighty-four junior college teachers from fifty-one different institutions at Bennett College in New York recently. With urgent feeling he said:

> I've taught in four-year liberal arts colleges and in a university. I've got my Ph.D. union card. I wasn't squeezed out of any of those places. I left because I didn't see any future but research and narrower and narrower concentration. And I wanted to teach. Now listen—my last three years in a public junior college have been the toughest, most challenging, most exciting teaching experience of my life. How do we communicate *that* to these thousands of recruits we need for teaching in our kinds of places? Seems to me we had better find ways to blow our horn more seductively yet louder.

There is no magical solution to this or any other educational concern. But there is promise, encouragement and cause for cautious optimism in the new directions now being charted for preparing, attracting, stimulating—and keeping superior teachers in our colleges. The task which remains is formidable, but not insurmountable. But it *is* a task which must be shared alike by the universities and the junior colleges. Both must willingly shoulder responsibilities; both must display vigorous initiative. The immense academic and research resources of the universities must be pooled with the "laboratory" resources of the junior college. And this "mix" is possible only if the junior college administrator pays more than lip service to providing a viable "climate for teaching," and only if the university displays more than a fainthearted approach toward developing programs which are rigorous and realistic. It is really not simply a matter of new directions—but new and *more* directions, directions sought by the universities and the junior college, acting together as peers, in a common effort toward the achievement of a crucial educational objective.

ROBERT E. KINSINGER

INSTRUCTION IN NURSING

Winslow Hatch, in *What Standards Do We Raise?*, identifies willingness to experiment and evaluate progress as a major criterion for measuring institutional excellence.[1] Following that criterion, nursing educators can take pride in the contribution that they have made to junior and community colleges as well as to the specific operation of their own departments. Nurses have led in experimenting in curriculum design and in investigating new approaches to the teaching-learning process. Their contribution is not surprising when the development of associate degree nursing education is considered.

BACKGROUND FOR INNOVATION

The associate degree nursing program is one of the few broad educational developments that actually grew out of a national research project.[2] It represented a radical departure from the existing pattern for nursing education, made venerable by long years of service and solidified by an almost religious approach to nursing—complete with a candlelight capping ceremony; the Nightingale Pledge, and a quasi-military heritage. Education and service had become so intertwined for many nurses that an attack on nursing education was equated with a breach of faith and a direct violation of the nurse's solemn dedication to service and sacred responsibility.

In the face of such obstacles it was the adventuresome nurses, the fearless innovators, the foolhardy, and to their detractors, the renegades, who were attracted to associate degree nursing education in the early years. The new programs tended to create readymade sororities of iconoclasts. They appeared, to the innocent administrator, to be just another new department of the college. As many a college president and dean now knows, these women were crusaders. Any pedantry was fair game to them.

This situation has been of great value to the colleges. Every institution needs someone or some group occasionally to rock the boat. These ladies rocked the boat on junior college campuses from coast to coast. They were willing to experiment because their whole professional life at that point was an experiment.

THE IMPORTANCE OF EXPERIMENTATION

We have a great number of surveys and studies that report "The experimental nature of colleges appears to be a good indicator of quality because only competent faculties are apparently disposed to experiment. They may be the only ones that dare to experiment."

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[1] Winslow R. Hatch. *What Standards Do We Raise? New Dimensions in Higher Education*, No. 12 (Washington, D.C.: U. S. Government Printing Office, 1964), p. 16.

[2] Mildred Montag. *Community College Education for Nursing, An Experiment in Technical Education for Nursing.* (New York: McGraw-Hill Book Company, 1959.)

"While reports of such experimentation and achievements may be impressive, no institution or group of institutions and no agency or organization has grounds to be complacent about what it has done to improve the quality of . . . education. A review of experimentation . . . indicates that quality leads to experimentation, and experimentation may enhance quality."[8] In the light of this statement, what have nurses contributed to the two-year college by their receptivity to innovation?

FOUR EXAMPLES OF INNOVATION

Time does not permit a detailed inventory. But their success in getting faculties to reexamine the content and arrangement of curriculum, to challenge long revered teaching methods, and to use the clinical resources of community agencies as laboratories and as an extension of the college campus, constitute many contributions. I will cite only four specific instances in which nurses took the lead in carefully identifying and solving an educational problem by using the findings of psychological research and new developments.

The four examples fall into the categories of: (1) curriculum reorganization and new approaches to the presentation of subject matter; (2) innovations in the use of instructional aids; (3) contributions to independent study; and (4) the use of technology to stretch instructional talent.

CURRICULUM REORGANIZATION

One of the most ambitious efforts at curriculum reorganization was based on a belief that the traditional nursing curriculum, centered around discrete subjects such as pharmacology, diet therapy, communicable diseases, and nursing arts, set up needlessly artificial barriers between theory and practice. The teaching of neurology, orthopedics and gynecology was radically altered to shift the focus to health and nursing, utilizing a problem-solving approach. This new curriculum organization permitted the faculty to keep the students' attention on the patients' health problem and its solution rather than to concentrate on a series of nursing skills to be learned for their own sake, or on a body of knowledge to be learned for the instructor's sake. The patient-centered approach to nursing enabled the student to bring a cumulative theoretical and experiential background to bear on nursing problems. The outcome was the ability on the part of the students to apply broad principles which could be interminably modified to meet varied nursing problems.

The impact on the rest of the faculty was felt in several ways. The nursing faculty had to depend on the science faculty, those teaching the humanities, and others to be very clear about basic principles they were imparting to students. The nursing faculty expected to teach these principles as they related to nursing. The nurses sometimes asked embarrassing questions of their faculty colleagues regarding course objectives, sequence, emphasis and time schedules. They had to know because they couldn't assist their students with applications to nursing unless they knew when and how their students were learning science principles and social and psychological concepts. They disturbed many faculty members with their searching questions.

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[8] *Ibid.*, p. 16.

USE OF COMMUNITY AGENCIES

Associate degree nursing instructors, applying the patient-centered problem-solving approach, sought out the most meaningful experiences for their students wherever they might be found, particularly in a number of community agencies. They wanted nursing problems for their students to solve and these problems were where they found them; not just in the general hospitals, but in clinics, departments of welfare, special schools for cerebral palsy and mental retardation, nursing homes, Alcoholics Anonymous meetings, nursery schools, physicians' offices, rehabilitation centers and many, many more institutions and agencies. The ingenious ways in which the nursing faculty moved out the walls of the college to find learning experiences in so many varied settings, and the ability of the nursing instructors to obtain the enthusiastic educational partnership of community organizations, was revealing. This was not the concept of the time tested field trip or the short term affiliation but rather a true extension of the college campus into the community. Artificial problem solving in college laboratories was not their interest. They wanted nursing problems from life—and they found them.

A NEW INSTRUCTIONAL AID

Turning to innovations in the use of instructional aids, a single example must speak for many developments by nurses.

At one institution an ingenious nursing faculty has partially solved the problem of individual differences. The universal but maddening pressures to teach for the average, leaving the slow student behind and boring the superior student, is particularly troublesome in the area of simple nursing motor skills. The bright student sometimes grasps the skill after one demonstration and needs practice only to develop speed. The dull student must be shown again and again between practice sessions. To solve this problem a tireless unattended machine was developed that could be used to repeat the demonstration over and over in a practice laboratory equipped with materials for handling and manipulation.

"The device consists of a slide projector and prerecorded tape enclosed in a locked cabinet. The cabinet is mobile, rolls easily on large casters, and has simple external controls for starting and for volume variation. Once the starting control is pressed, the slides appear on the screen in proper sequence, while the taped voice of the instructor comments on or explains each successive slide. On a signal from the tape, the slides automatically change. Each set of slides deals with a specific subject or technique, ranging from relatively elementary procedures, such as making a bed to a more complex one, such as intravenous infusion and catheterization."[4] The machine automatically resets itself and is immediately ready to repeat the lesson in response to a push on the starter button.

This solution of a unique drill problem has made it possible for students to practice on their own time and at their own speed until they feel comfortable enough with the skill to enter the clinical area. As they practice, they have a ready reference before them. It is not a substitute for an initial demonstration, discussion and guided practice, but it is a valuable and inexpensive supplement for perfecting motor skills—just one of many such ingenious solutions.

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[4] Maja Anderson. "A New Aid to Teaching and Learning." *Nursing Outlook*. November 1961. Vol. 9, No. 11, p. 677.

PROGRAMMED INSTRUCTION

E. L. Thorndike forecast the importance of turning theories of learning into practical applications as far back as 1912 with the following statement. "If, by a miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on page one would page two become visible, and so on, much that now requires personal instruction could be managed by print." As all educators are aware, the development of the book of which Thorndike dreamed has come to pass in the form of programmed instruction.

Nurses in community colleges were quick to explore the possibilities of this new development. The first complete programmed unit in nursing was developed as part of an associate degree nursing project and the field testing was carried out in community colleges.[5] This initial work on asepsis was not merely an academic exercise but is currently being used widely as part of the regular program in many associate degree programs. The time required for presenting the materials is substantially reduced when using programmed instruction. A major recommendation growing out of the original study reads as follows:

> It is recommended that when programmed instruction is to be used, the instructors involved should cooperatively consider ways by which "freed" time could be most effectively utilized.[6]

Nursing faculties readily accepted this suggestion and are now working at the problem of gearing the use of programmed instruction to the needs and abilities of students and asking, How should "freed" time be used by instructors and students? Should the extra time be used for enrichment or should the asepsis unit be shortened?

The work on asepsis is not an isolated instance, only the first. At least three other entire programmed units in nursing have already been completed and are now being field tested in community colleges. *Mathematics for Nursing Science,*[7] written by a community college instructor, will be published this fall for use in the associate degree nursing program. The development of this programmed unit in arithmetic is an excellent example of the way in which an educational problem was first clearly identified and then followed by a search for the solution. Nursing students were coming to college in large numbers without adequate skill in the manipulation of fractions and in handling problems involving ratio and proportion. The nursing instructors responsible for teaching the nursing applications of pharmacology clearly viewed this lack of a prerequisite skill in arithmetic as a remedial problem. Neither the nursing faculty nor the mathematics faculty (whichever fell heir to the problem) were anxious to steal the time from their primary instructional responsibilities to undertake this remedial task. Early results of field testing indicate that a programmed screening test, a self-administered programmed course, and a programmed post test may in large measure solve this educational dilemma.

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[5] Marie M. Seedor. *Programmed Instruction for Nursing in the Community College.* No. 4 of the Nursing Education Monographs (New York: Bureau of Publications, Teachers College, Columbia University, 1963), p. 17.

[6] *Ibid.*, p. 74.

[7] Sally Lipsey. *Mathematics for Nursing Science* (New York: John Wiley & Sons, 1964).

CLINICAL INSTRUCTION AND CLOSED CIRCUIT TV

"Educators have insisted that the intensely personal task of education cannot be mixed with the cold scientific approach of technology. The literary tradition of education sits uneasily with the scientific tradition of the technologies."[8] However, a number of nursing faculties have refused to keep teaching-learning activities tied to hand labor. Their use of television is particularly imaginative. They have used it for demonstrations from nursing laboratories; for psychiatric observation; research in teaching methodology; orientation to the hospital; observation of clinics and patient discharge interviews; clinical teaching; and analysis of student skills.

The last two uses are particularly significant because one of the most crucial instructional problems today involves teaching clinical nursing. Reasons for the pressing need to stretch instructional talent in the field of nursing are painfully obvious. The ever-increasing demand for nurses, the growing complexity of the profession, and the resulting requirements for instructors with additional educational background have combined to create an instructional bottleneck that threatens the health of the nation. Extensive experimentation designed to apply recent technological advances to the teaching-learning process in clinical nursing has been carried out by the nursing faculty and students at Bronx Community College.

The educational problems for which solutions were sought are old ones to nurse educators, but in recent years they have been aggravated by changes in hospital architecture and procedures, and by changes in nursing education itself. The prevailing teaching environment and the method of instruction in clinical nursing provides the student with opportunities to practice in the hospital under the careful guidance of her instructor. The student must have frequent access to an instructor's knowledge and ability to assure steady improvement of skills learned in the classroom. Clinical instructors can teach only a severely limited number of students at one time because of the kind of tutorial teaching required. The number of students assigned to an individual instructor is further restricted because she must move from room to room in the hospital where students are with patients. The trend to build more and more private rooms in hospitals has increased the isolation of the instructor from the students in their "clinical classrooms." The growing emphasis in nursing education on intensive use of carefully selected learning experiences also has increased the need for more frequent contact between the student and instructor during the period of clinical practice. Patient safety is another ever present concern.

One key to effective utilization of the student's experience with patients is a postclinical conference. During the seminar, which is held immediately after students leave the practice area, the students and their instructor discuss the implications of the day's experience. By this method, clinical experiences are reinforced, corrections are made, questions are answered, and students share their experiences.

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[8] Robert E. Kinsinger. "Technology and Imagination = Education Evolution." *Nursing Outlook,* Vol. 11, No. 4, pp. 252–254.

Two broad educational questions are inherent in clinical nursing instruction as described above:

1. How can an instructor satisfy the safety factors involved in working with hospital patients and, at the same time, meet the needs for individualized instruction of an increased number of nursing students?

2. How can students be helped to consider their individual nursing performance more objectively in order to increase learning through a critical self-evaluation of their nursing activities?

The problems were considered in the light of new technological advances in television which might help provide new solutions to old educational questions. It was considered essential that imagination be used rather than mere accommodation. However, the existing educational setting in the hospital, a service oriented institution, presented a rather rigid educational framework within which to operate.

To make the instructor more available to the individual student, it seemed logical to use the latest technological development in sight and sound transmission rather than try to rearrange the location and access of patients' rooms, or facilitate the physical transportation of the instructor. Recent improvements in closed-circuit television equipment have brought the cost of such equipment within reach of the average nursing education budget. With some ingenuity, the engineering necessary to provide an uncomplicated, trouble-free switching system could be designed, and such a system would not require special lighting or in any way interfere with the normal routine of the hospital. In addition, comparatively inexpensive television recording equipment was available so that the instructor could record for immediate playback audio and video signals that she received during the period that students were practicing nursing skills.

Fixed focus television cameras were installed in patients' rooms where students would be learning nursing skills. The cameras send pictures and sound from the patient rooms to an instructor monitoring room (receiving station). Only nurse educators are permitted to enter the room where the instructor receives the TV pictures, hears, and talks to students. This arrangement assures the patient the same privacy that he was afforded previously when the nursing instructors visited patient rooms. To reassure patients in regard to provisions for privacy an informational booklet is given to each of them. In addition, each patient has the plan explained by a nursing instructor. The patient must volunteer to participate.

The cameras, prominently mounted on brackets high on the wall, are kept covered except when a nursing class is being conducted. A microphone is mounted on the wall of the patient's room to pick up the conversation between the nursing student and the patient. A light in the room indicates when the system is operating. The student is able to hear the instructor through a small wireless receiving set worn in the ear. If the student desires contact with the instructor, she may signal her by pressing a button which is also mounted on the wall.

The instructor may use either of two monitors. One can be set automatically to be switched at a predetermined time interval to the next patient's room. The two-way sound system switches automatically with each change of camera. The room change may be effected either with the automatic switching system or manually. The instructor is free to leave the monitor to go to a patient's room when necessary. No technicians or auxiliary personnel are necessary to operate the equipment.

The videotape recorder can be switched on at any point to record the audio and visual signals being received for immediate playback during the post-conference when it is viewed by all of the class on a 24-inch screen. Students see and hear their own performance with patients, and, with guidance from their instructor, they have an opportunity to analyze their physical and verbal nursing skills and attitudes in actual nursing situations. The videotape can be reused, and, if desired, a kinescope can be made of the tape recording to preserve it for future classes. A whole series of teaching films may be developed in this manner. In addition, for evaluation of student performance, all nursing instructors in a program may view a student in the same clinical situation through the use of videotape recordings of their performance.

The formidable task of developing, using, and evaluating a new system of instruction was faced after the educational problems were identified. Only then was the system described above devised as a potential means of attacking the difficulties. The research design had to focus on determining whether the seemingly straightforward solution is in reality only the introduction of a series of gadgets which leave the basic situation unchanged, or, worse, complicates it. The approach was not merely to add new electronic devices to make it easier to do things in the old way. It was hypothesized that with this system the teacher would manage the learning environment in a different more effective manner, and the student was enabled to learn in ways not possible before. The research staff faced a severe challenge to develop reliable and valid measurements of the impact of closed circuit television on the process of learning clinical nursing.

A definite conclusion was reached. More students can be taught without increasing the number of instructors and in a significantly more effective manner by using closed circuit television in the clinical area. Community college nursing programs across the country are considering the possibility of breaking their instructional bottleneck by employing this innovation developed by faculty members to challenge the "Establishment."

The junior and community colleges have offered the nursing innovators a home, but clearly the colleges have benefited greatly from the ferment which these educational revolutionaries brought with them.

SECTION II

Experimental Colleges: Case Studies

WOODBURN O. ROSS

MONTEITH COLLEGE OF WAYNE STATE UNIVERSITY

Monteith is a four-year, degree-granting, undergraduate, general education, experimental, liberal arts college. First, it is four-year, while most general programs are two-year. It is degree-granting, though I believe there is hardly another example in the country of a degree-granting general education program. It is undergraduate. Monteith does not concern itself with the graduate school at all. If the time comes when some graduate offerings are developed, they will be, I predict, quite heterodox. Monteith is experimental. Perhaps "innovating" is a more appropriate term. The College attempts deliberately to develop new synthetic academic disciplines—natural science, social sciences, humanistic studies. It feels compelled to produce many of its own texts. The College stresses instruction by dialogue between instructor and student, and among students. The College is small and proposes to remain so, hoping to demonstrate that the spirit of a small intellectual community may permeate a group of students on the campus of a huge state university.

Monteith came into being for a combination of reasons. Six years ago the administration of the University was much concerned because of a faculty report which named improvement of general education as perhaps one of the greatest problems for the University in the years ahead. A second reason was the fact that Wayne is located in a great city and, for the most part, has a commuter student population. This University became conscious of the enormous number of commuters who were poised to seek admission, and began thinking of how to meet their needs. Those of us assigned to solve this problem decided that we wanted to experiment with the possible virtues of a small college. There was something about independent study in our background, too, produced on the one hand by the growing consciousness of Americans that European undergraduate students become more intellectually mature than ours, and, on the other hand, by the impending shortage of American teachers.

When a committee was planning Monteith, it seemed manifest that if the new organization was going to do a job and do it well, it was going to have to be autonomous. It appeared that it would be simply impossible for it to accept the conventional values and procedures if it was going to innovate. For example, the Wayne Liberal Arts College, like most liberal arts colleges, was and is placing more and more emphasis upon published research. We could not see how it was going to be possible for a staff to be creative in the devising of new disciplines, to do a particularly fine job of teaching, to organize a college community—to do all these things at the same time, and also meet demands for extensive research carried on in the conventional disciplines. It appeared then that the new organization would have to have control of its own policies if its faculty members were to be consistently rewarded properly. The central administration also agreed on the establishment of an autonomous college. One of the major foundations of the country felt similarly. Ultimately we found ourselves holding upward of three-quarters of a million dollars which we could spend in the promotion of an autonomous college.

PROCEDURES AND CURRICULUMS

The procedures and curriculums of the college will be of interest to you. As an example of our departure from normal procedure, we do not teach freshman English composition, a course conventionally required of freshmen. There is no college course which is more universally distrusted than the course in freshman composition. It is frequently disliked by the very persons teaching it, and sometimes accepted only with reservations by the university which it purports to serve. There is serious question as to whether one can be taught to write after a certain possible critical age. I am told that if a baby has not learned to talk by the time he is five, he and his parents are going to be in some difficulty. It may possibly be that the person who has not learned to handle a pen with at least minimal effectiveness by the time he is fourteen may have passed a critical age in learning to write.

I am speaking about the average student, not well motivated to write. I suspect that we can indeed give good help to the student who loves to write and has already gained when he comes to us some proficiency in writing, and is eager to pick up hints on how to write more effectively.

But let us lay aside the question as to whether we can really teach composition to the average, relatively unmotivated student who is old enough to enter college. Let us assume that we can. The question of proper procedure then arises. It is assumed that if you want to teach somebody to write you put him in a course on writing. If you want anybody to learn anything, put in a course on that subject. Perhaps this is not the way to go about it. Perhaps the thing to do if you really can help him to write is to make an experience in writing a part of the constant experience which he has in college classes. This is exactly what we undertake to do at Monteith, optimistically hoping that we can thus alter students' writing habits. We officially make it the responsibility of each division in the College (there are three divisions—not departments) to see to it that their students write as effectively as possible. Writing thus is made quite functional. No student writes a paper as an exercise in writing. He writes to explore an idea in a discipline which he is studying. Criticism of his writing is directed not to writing *per se,* but to disorganized, or unclear, or inelegant presentation of his material.

FACULTY REACTION

How has the faculty, only two of whom were trained in English, taken to the matter? Rather well. They are, for the most part, quite willing to assume this new responsibility. Their criticisms of writing, such as I have seen, seem to me not as clear and pointed as those of a professional English instructor might be, but at the same time more functional and more humane. What is the attitude of the students? We have more requests by students to take work in the English department than I would have thought likely. They do not find the training which we give in composition to be repulsive, and do see it as an integral part of their course work.

I review blue test books and papers from time to time. I do not know of any way of measuring to the satisfaction of everybody what effective writing is, and consequently must evaluate subjectively. My judgment is that our students are writing as well as or possibly a little better than the students whom I had in the English department under more conventional circumstances. I ask you to understand that I am not only airing suspicions about what can be done in teaching composition, but am adding the further suggestion that the conventional way of doing it, even granted it can be done, may not necessarily be the right way at all. Certainly, however, it's the most expensive way to go about it.

USE OF THE LIBRARY

We were hardly organized when we became concerned about our students' use of the library, and we invented a library project. It was a deliberate and formalized attempt to make the library functional in the lives of students. The federal government gave nearly a hundred thousand dollars for the project. Our feeling was that most students would come to feel the real value of the library only if they were given a sense of its immediate relevance to their work. We wanted to develop in them a sense of the oneness of their experience in class and their experience in the library.

The first step that the director of this project took was to attempt to introduce people from the library staffs into the teaching staff of the College as observers and participants in planning. It was the notion of the director of the project that librarians and classroom teachers should work as a single team, since both were engaged in the task of education. The process began in the Division of the Social Sciences. One of the first discoveries made was that librarians were unacceptable as acting staff members. They were viewed as extraneous. This was quite a discovery. No wonder undergraduate students in so many instances view the library as an institution extraneous to their undergraduate careers, when the faculty teaching them view the librarians similarly. Do not misunderstand me. These faculty members indeed saw the library as having a most intimate connection with their lives, but not such a relationship with the planning or teaching of their courses. They used the library for the sake of preparation and for the sake of formal research. They did not, however, accept the librarians as equals in the formal educational process. We attempted to alter this view and to make the lives of the faculty members easier as far as the use of the library was concerned. Each faculty member who was going to find himself involved in a new and complex experience with the library was given a bibliographic assistant. We devised courses which were being given for the first time in such a way as to integrate the library with the course. As a result, it became part of the very nature of the eventual formal development of the courses for many of the students to come to think of the library not as something outside the course, not as an addendum to, but as a necessary source for the work which they were doing and which they wanted to do.

After this beginning in one division of the College, the director of the project repeated the process in the other two divisions. Since both time and money were by now running out, no such thorough job could be done with these as with the first. The total effect on the students, however, was exciting. A great many made the library a normal part of their college experience and learned the excitement which it offers. The College is now attempting to secure support for a project designed to discover means of incorporating into the permanent procedures of the College the results of the lessons taught by the exploratory project.

GENERAL VERSUS SPECIALIZATION

The synthetic academic disciplines made necessary for the undergraduate by the explosion of knowledge today is, I think, relatively new. These disciplines go by the names of Science of Society, Natural Science, and Humanistic Studies. We are standing not on ground which we regard as completely firm, but on ground which we wish to defend when we say that the usual departmental organization today is far more suitable for research in the conventional sense of the word than it is for the organization of instruction of undergraduate students. Specialisms are becoming and must become more and more special. They are not suited to the general student—and every student is a general student, except in the area of his speciality. For example, it would be difficult for the English department to undergo a rigid challenge as to why there should be any university-wide English requirements, either for composition or for English literature courses. That there should be requirements in the arts I have no doubt. But I suggest that literature should be considered simply one of the arts. Undergraduates taking work in this area should explore man's experience in the glorious, creative world of the imaginative arts. Why we characteristically select one of the arts and require it at the expense of the others, I do not know. The reason our experimental college does not do it is that we entertain a concept of the world of the arts as differing from the subject matter of the social and natural sciences. It is a product of the human imagination which has a complex but very real relationship to the world of experience, at one and the same time a work of aesthetic delight and of intellectual criticism.

Similarly, we believe that the undergraduate should explore in an organized fashion man's experience with and insight into himself as a social being, rather than serve as snippets of the disciplines of sociology, political science, social psychology, and economics. And we feel similarly about the natural sciences. With the present explosion of knowledge, exposure to only one or two disciplines will leave huge areas of ignorance in the general student's mind.

RESEARCH AT MONTEITH

Research is a challenge which many junior colleges, as well as other institutions of higher education, fail to accept. Perhaps this lack of acceptance arises from the fact that understanding of research on the part of the whole academic community is too conventional.

At Monteith we have felt this difficulty too, but for the moment it seems to have solved itself spontaneously. Research is a creative act. As such it has great and, indeed, necessary virtue. But it is not necessary or desirable that all research be alike, that the same methods be followed, that results of the same nature be sought. We are performing an act of research as we devise the disciplines which we teach, as we seek more effective means of reaching out for our students. The constructive, creative acts which are necessary in the building of something educational and something new require writing, thinking and discussion. This is a different kind of research, research of a pedagogical nature which is plowed right back into the classroom for the use of the students. This kind of research is necessary to us both to save our souls in an act of creation and to communicate effectively with the students who have been entrusted to us. A similar kind of research is perhaps necessary in the junior college.

STUDENT-TEACHER DIALOGUE

I turn now to another matter. Each of our three basic courses, one in each division, continues for approximately two years. Each of these courses carries four hours credit per quarter. Students meet twice weekly in large lecture groups, and twice a week in smaller discussion groups with approximately twelve persons in each. In the discussion groups, we genuinely attempt to bring about an intellectual dialogue between the instructor and the students. This demands much of the art of teaching, but it serves an important purpose. The small discussion group provides rare opportunity for innovation and intellectual exchange.

A developing dialogue among students also helps form a community. We were resolved from the start to bring this about. We have a small student center, and here the dialogue continues. To this building, outside speakers are invited; here political plans having to do with the College or the University take shape; here social events are held. A foundation has provided some $75,000 with which to remodel and furnish a building in which an intellectual community of faculty and students can be fostered. There is a need for a sense of community in all colleges that fosters joint search on the part of people, most of whom know each other, for knowledge, for wisdom, for insight.

Finally, in this analysis of the Monteith experience, I believe we are gaining some firm knowledge about results we have achieved. The federal government gave us a very substantial amount of money to carry on extensive research about the development of the first class which entered the College in 1959. We have issued locally a report on demography, intellectual results, the students' views of themselves and of the College. Shortly we shall have much more material, and we shall submit all this information to the U.S. Office of Education. Here I have time to cite but one or two facts.

We gave all students in our first graduating class the area portion of the Graduate Record Examination. The class averages in the Social Sciences fell in the 72 percentile. The general average of the class was approximately in the 75 percentile. Our students are not specially selected any more than the University selects its other students. It admits those who have "B" averages in high school, or those who can pass entrance examinations. In short, we are not an honors college. Secondly, on the Intellectual Climate portion of the College Characteristics Index, the score Monteith College achieved was distinctly more than a sigma above the national mean.

RELATIONSHIP TO THE JUNIOR COLLEGE

Does all this have any immediate relationship to the junior college? I think it does. For there's one fear which I have concerning junior colleges, resulting from the experiences which we have had in Michigan. I am afraid that they are going to act as a conservative force in education. But it seems to me that you have the opportunity to be something different—to be experimentalists, to move out for yourselves rather than be shaped by the universities which are concentrating upon tasks of research in the conventional disciplines. The influences upon you to become conservative, to follow in the footprints of those who are not doing what you are doing, must be strong indeed. Monteith, an innovating college, cannot accept students from the junior colleges of Michigan unless these students wish to spend more than four years as undergraduates. The programs of the junior colleges in Michigan are conventional, made so, these colleges feel, by the necessities of their position. This presents a problem difficult to solve. It seems to me that the best hope for junior colleges is to prepare students well, to consciously avoid conservatism. Programs should be tailored for students rather than for the universities to which some of the students may eventually transfer. It is likely that those of you who choose to be innovating will, as a matter of fact, have little difficulty, even with students continuing in a university.

WARREN BRYAN MARTIN

RAYMOND COLLEGE OF THE UNIVERSITY OF THE PACIFIC

Somewhere in the New Testament Jesus speaks against putting new wine in old wineskins. This is a warning that has relevance for institutions of higher learning, although with educators the problem is trying to put new wine in old wind-bags. The old bags crack under the catalytic action of new ideas because most professors are conservative in the extreme. As Clark Kerr and others have pointed out, the image of the university as a radical institution is applicable only to its external operations—educators are willing to take chances when the chances involve other people's interests—but within the institutions of higher learning the life pattern is characterized by conservatism. Dogma, I have always thought, is faith become fear and nowhere is dogmatic rigidity more in evidence than among professors when they are asked to think hard about the curriculum and the interior organization of their program. Dean Harold Greenley of Coe College, in discussing curricular innovations that are presently being undertaken in that school, lamented the fact that the biggest problem he had was with faculty members who were unwilling to take a critical look at their materials and teaching procedures and were intent upon forcing their own ways and the old ways on the new opportunities. Lest you think that I am beset by an administrative mentality that does not appreciate the dignities of teaching, I want to inform you that I came into administration out of college teaching. As a teacher I held all of the prejudices, fears, and apprehensions that professors hold about administrators. Now, after three years as an administrator, I have found that all those fears and doubts were abundantly justified. Administrators are no better than professors when their security base is challenged. I mingle with administrators who have seven principles—five loaves and two fishes—and they hesitate to change the menu.

Now I have talked about the educational security psychosis in order to establish the general context for the changes that have come in recent years at the University of the Pacific. I must now speak for a moment about the specific context in which these changes came. The University of the Pacific is the oldest chartered institution of higher learning in the State of California. It was established in 1851. Through the years, and until quite recently, it was a good, middling sort of liberal arts college. Its influence was local or at best regional, and its constituency was essentially Methodist. It was College of the Pacific, COP; it was Almos Alonzo Stagg and Eddie LeBaron. But in the last decade or so the University has broadened its program so as to justifiably claim the title University of the Pacific, and the constituency has become considerably more ecumenical and, indeed, secular.

And this school, like all others having any degree of perception in this epoch of revolutionary change, has been engaging in critical self-analysis and asking pointed questions about the future. What should be the role of a private, comparatively small university in California in this age when men stand at the confluence of several simultaneous and intersecting revolutions? What does such a school have to say to the political, economic, social, and moral upheaval of our time? What is Pacific's place amid more than seventy public junior colleges, eighteen state colleges, and nine campuses of a major state university? How can Pacific compete in a state where there are one hundred and forty educational institutions of one sort or another? We also had to ask some questions about how we proposed to meet the challenge presented by the new students who are coming on in these new times.

In my worst moments, I think that students are to a college as pigeons are to a cathedral. Yet most of the time I know that students are to a college as the worshipers are to a cathedral. They give it life and vitality. Each year we see more and more students with a capacity for trenchant criticism. They are pointedly impatient with mediocrity in all of its forms for they know that mediocrity will not meet the challenge of these times. This "generation of concerned young people" do not want to attend a school that is nothing more than a country club in the San Joaquin Valley; nor do they want to be entertained in some sort of academic zoo where professors pace up and down their runways like animals of habit, and administrators go about picking up peanuts from the public a la monkeys, and students bask and stretch in the sun like lazy seals on a rock. An attitude of apathy, indifference, docility, and mediocrity simply will not suffice now. These new students mean to find an educational program that will help them work out an ethic of individual honesty and an ethic of social responsibility. Pacific's administrators had to ask what we could do to provide on our campus an atmosphere of excellence that would be responsibly critical and responsibly creative. We had to assay our philosophy of education. We saw this to be necessary for both idealistic and utilitarian reasons. Today, as never before, the first shall be first and the last shall be lost.

There is another point to be emphasized. Despite the conservatism among educators, about 15% of the institutions of higher learning in this nation have shown that they are uneasy about the adequacy of their old wineskins, and they have been taking a hard look at both the curriculum and the methodology of their programs. Pacific was in this group. Like others, we have been troubled by specialization in the parts and the fragmentation of the whole. We have been concerned about the mesmerizing effects of grades and the conventional testing program. We have wondered what to do about the threat of depersonalization and mechanization on the campus. How could Pacific establish a pattern of growth in a growing state and also speak creatively to this multitude of problems?

It was in 1960 that President Robert E. Burns and the Board of Regents decided that the best solution for Pacific was in a formula for growth that would be called the "cluster college concept." The University of the Pacific would move to establish a number of individual units called "cluster colleges" that might have any one of three levels of relationship to the University. There would be programs for which the University had a direct and academic and fiscal responsibility (as you will hear, Raymond College and Elbert Covell College are of this sort); then there would be programs for which the University would have academic responsibility but little or no fiscal responsibility (St. Michael's College, sponsored by the Episcopal Church, and about which you will hear more later, falls into this category); and, finally, there might be established those programs in geographical proximity to the University and for which the University works out some measure of reciprocity in the use of facilities and talent, but which would have both academic and fiscal autonomy (an example may be seen at Claremont where the School of Theology at Claremont is located adjacent to the Claremont colleges but stands in complete autonomy from them). Each cluster college, however, whatever its formal relationship to the University, would have sufficient freedom and autonomy to work out its own program and establish its personality. Thus, Pacific would have in the "cluster college concept" a way for the University to grow larger without getting "big" and increasingly impersonal. There were, of course, other advantages in the concept. The establishment of the cluster colleges would not only be a pattern for numerical growth, it would also provide a mechanism for innovation along curricular and organizational lines. Knowing full well how difficult it is to effect change in the oldest chartered institution in the State of California, it was seen that the better way to achieve the freedom necessary for experimentation would be to set down a new college within the general structure of the University but outside, for at least a period of time, the power structure of the older units of the University. So, we proceeded to work out a formula for the establishment of a cluster college that would guarantee its freedom for substantive innovation. That formula, the details of which are still being implemented, reads as follows:

> Each new cluster college that is proposed for the University of the Pacific will draft a prospectus of its curriculum and organization, with this prospectus to be prepared by the Planning Committee (of which the Academic Vice-President and one other representative of the University of the Pacific will be participating members). The prospectus will then be presented for approval to the President and the Executive Policy Committee of the University.
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> The Executive Policy Committee is authorized, at the recommendation of the President, to grant said cluster college an "interval of innovation"—a period of not less than five years in which the new college is given "autonomy" to formulate and implement its program. This autonomy is limited by the following provisions: during the "interval of innovation" the administration of the new college is required to report to, consult with, and, finally, in the case of irreconcilable conflict, to be subject to the President, Academic Vice-President, and the Financial Vice-President of the University. The college is free, however, during the interval of innovation of the control, though not the fraternal advice, of the University's general faculty, committees, and staff personnel.
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> At the close of the stated "Interval of Innovation," the administrative head of the cluster college will present the curriculum plan and the organizational structure of the college to a regularly scheduled meeting of the University of the Pacific faculty for a formal vote on the issue of an "authorization to proceed" as a college within the University. If at this time, serious modifications are recommended by vote of the University faculty, or if the "authorization to proceed" is withheld, the issue shall be handed to the Executive Policy Committee of the University for an adjudication of the points at issue.
>
> If a second presentation of the curriculum and organization of the cluster college

does not win the "authorization to proceed" from the vote of the University faculty in regular meeting, the final decision on the formal standing of the cluster college in the University will be made by the Executive Policy Committee and an equal number of full-time faculty members from the University faculty sitting as a Committee of Decision. The President of the University will preside over the Committee of Decision, and he will vote in case of a tie.

Allow me to observe, parenthetically but not incidentally, that in these matters effective government is government of the few. A stalwart individual or a small committee may be a catalyst for change but the large committee or the masses almost never are. So, mechanisms must be devised that will make it possible for a creative coterie to work free of interference from the hosts of administrators and faculty people who are always eager to get their hands on a new program and make it over in their image. If the cluster colleges at the University of the Pacific were to be a means of substantive innovation, as well as a formula for numerical growth, we found it essential to devise ways to pour the new wine into new wineskins.

There is another advantage in the "cluster college concept" that should be mentioned. Pacific decided that in most cases the size of the new colleges would be limited to approximately 250 students. This was an arbitrary decision but it was based on the report of Oxford and Cambridge people who felt that their colleges were at their best when they were this size. Now, obviously, a college of 250 students is not an economical proposition. However, if two or three such colleges can be constructed in geographical proximity for the benefit of auxiliary services, especially in such a way that their dining rooms join on one large kitchen, then the venture becomes economically feasible. Furthermore, if these new colleges can use certain existing facilities in the older components of the University—the central library, laboratories, infirmary, business office—then tremendous savings have again been realized. It becomes possible to establish a new college of 250 students for three or four million dollars rather than the eight or ten million dollars it would take to put the same facilities and services in the isolation of an Iowa corn field. So you see the economic advantages of the "cluster college concept."

Now the first-planners at the University of the Pacific, particularly President Burns and Dr. Samuel Meyer, Academic Vice-President, decided to work on a time-table that would bring about the creation of six such colleges over the next twelve to fifteen years. An early burst of enthusiasm that suggested the possibility of fifteen colleges in fifteen years was quickly tempered by the existential realities attending the establishment of Raymond College, which began operation in the fall of 1962; Elbert Covell College, the Spanish-speaking liberal arts program which began with its first class in the fall of 1963; and St. Michael's College, the Episcopal liberal arts college which is scheduled to open in the fall of 1966. We have had a lot to learn and one of the first things we learned is that buildings do not a college make. While it might have been possible to build the facilities for fifteen colleges in fifteen years, it is quite another matter to put into them the ideas and personalities that alone can make them authentic institutions of higher learning. So with our enthusiasm now tempered by experience, we are talking more soberly but still enthusiastically about six colleges in twelve years.

For the rest of the time that we have together, I want to talk to you in some detail about the first of the cluster colleges to be established at Pacific—Raymond College.

The establishment of this college was made possible by the generosity of Mr. and Mrs. Walter Raymond of Knights Landing, California. A gift of three thousand acres of fertile ranch land will bring to the University several million dollars and this money assures the financial stability of the Raymond College program. Administrators here might like to take note that one of the benefits of the cluster college concept is the appeal the idea has for prospective donors. As you have heard, we now have *Raymond* College and *Elbert Covell* College. How much this fellow St. Michael has contributed to the Episcopalians no one has been able to determine!

There were certain presuppositions that guided us in the establishment of the curriculum and the organization of Raymond College. From the first it was agreed that Raymond would be unapologetically small in size and uncompromisingly intense in its academic program. It would be a liberal arts residential college in which we would try to combine some of the best features of the Oxbridge philosophy of education with some of the insights and innovations that have been put forward by present-day American educators. Thus we would seek to combine the classical and the contemporary. The college would be entirely residential because we were persuaded by the Oxbridge experience that a great part of the student's educational growth comes in those casual encounters outside the formal classroom sessions. We saw that the most important educational experiences cannot be arranged with any precision. Some things can be structured, of course, but most of the ends we seek are achieved best and fastest by indirect means—by things said during a conversation in the Common Room, by a teacher's remark to a student at the lunch table, by a book picked up idly but put down reverently (when George Saintsbury was asked how to interest the young in good literature, he replied, "Leave books around"). We were persuaded that the best we could do would be to keep the student in the "climate of learning"; surround the student with a rich variety of intellectual and personal opportunities chosen with an eye to quickening his mind and his emotions; provide him with good "behavior supports," such as art and music and the Raymond High Table series (where students and faculty receive a speech or an artistic presentation, discuss what goes on with the scholar or artist, to the end that they may get the taste of an idea in their mouth and work it around like a lozenge until it melts and becomes a part of them).

To this end we decided not only to have students "live in" but also to have our facilities arranged in a quadrangle plan that would include faculty studies in each of the buildings; study-lounges in the residence halls, where seminars meet; faculty apartments throughout the quadrangle, so that students are more frequently in the presence of scholars; an art studio, the Common Room with its library of paperbacks and journals of opinion, the Great Hall where lectures and concerts are held; all of these things meant to contribute to the establishment of a "living and learning" relationship that would go far to break down the dichotomy that exists on so many American campuses between the living facilities and the learning facilities. Having some faculty members living in the quadrangle, actual experience has shown, contributes to an atmosphere of dignity that reduces the more coarse and ridiculous expressions of adolescent high-jinks while encouraging sophistocated and subtle expressions of the same. This is as it should be. Well, in all of these ways—by the insistence on the residential nature of the college and by the "living and learning" arrangement of our facilities—we have sought to do what we could to establish an atmosphere of excellence for the operation of Raymond College.

Another presupposition guiding the first-planners of the college was that it should be free to innovate in the curriculum and in its interior administrative organization. I want to speak now about what we have done to implement these interests.

The student entering Raymond College accepts a curriculum that requires a distribution of work in the classical divisions of the liberal arts—the natural sciences, the social sciences, and the humanities. While some variation in the student's program is possible, thus satisfying individual needs and aptitudes, the college has taken a stand with an essentially prescribed curriculum. We will not be put off by charges of "compulsion" or "authoritarianism." We believe that the best minds of the Western World have been able to reach a meaningful level of agreement on those things essential and those things peripheral to a liberal education. There can be no success in these matters without some requirements, yet, requirements at Raymond are not tyrannical and there is a good measure of flexibility.

However, every student at Raymond takes mathematics and an integrated science sequence in physics, chemistry, and biology (including labs). He also does a sequence in psychology, American studies, sociology, economics, and other social sciences; as well as a sequence in world literature, philosophy, fine arts, religion, and other aspects of the humanities. We contend that he cannot understand himself as a person in the modern world without experience in all these areas. I should like to add that Raymond courses try to meet the challenge of increasingly sophisticated high school preparation and the perennial pressure of graduate and professional expectations by the use of theme-oriented courses—courses providing depth study of themes and/or problems rather than attempting comprehensive coverage of the disciplinary areas of the curriculum. Aware of the explosion of knowledge, we know that it is ridiculous to try to be comprehensive in providing information. James G. Rice has warned:

> ... Transmitting "the facts" to young adults is not nearly so important as many would like to think. Half of such material, we are now told, is forgotten within a year. Even if remembered, the revolution in the sciences can quickly make it useless. As if all this were not humbling enough to the content-oriented instructor, he is further confronted with such things as learning machines and programed texts, proving at least in some ways more efficient than regular teachers in transmitting "the facts."

So we don't pretend to offer a comprehensive coverage of a discipline. What we do hope to accomplish is some penetration in depth; the development in the student of a capacity for judgment; and the cultivation of an intellectual curiosity that will prod the student into learning how to learn and how to mobilize his intellectual and creative energies. But we must proceed.

Raymond students take three courses each term. Each course may meet five hours per week and each carries five units of credit. It should be noted that because the Raymond program is regarded as a total educational experience it is not normally divided into "unit" segments, but units of credit can be given when required for transfer and transcript needs. By having the student take only three courses at a time we hope to achieve more depth than is possible when students are offered a huge curriculum in which they are encouraged to act like an old maid poking around in a box of chocolates seeking for a cream and then a caramel, a caramel and then a cream. We believe that allowing a student to take five or six courses at the same time encourages superficiality and intellectual dilettantism.

The absence of frills in the curriculum, the residential nature of the college with its quadrangle living facilities, the close contact with professors—the student-faculty ratio will be maintained at 10–1—and the emphasis on personal participation make possible an acceleration of the academic program. Raymond offers a 3–3–3 curriculum—three courses per term, three thirteen-week terms per year, and graduation with the Bachelor of Arts degree from the University of the Pacific at the end of three years. The three terms for the 1964–1965 academic year are as follows:

Freshman Orientation	August 26–29
Fall Term	August 31–November 25
Winter Term	December 2–March 12
Spring Term	March 22–June 18

Each Raymond term is twelve to thirteen weeks in length and each term provides sixty-two or sixty-three 60-minute class meetings. With five meeting periods of 60 minutes each per week, the Raymond student has more "contact time" with the professor than the student who follows a conventional semester schedule where there are seventy to seventy-five class meetings per semester (with examination days and other special events often included in this total) and only 50 minutes for each class meeting. Each term at Raymond, therefore, has the weight of a semester. Notice too that the total program includes nine terms rather than eight semesters. Graduating in three years, the Raymond student is prepared in a great majority of cases to enter graduate or professional training at the fourth year. In a day when many liberal arts colleges are floundering due to the fact that high schools are increasingly taking over the work once done by the lower-division college curriculum while the professional and technical pressures are continuing to push farther and farther down through the upper-division liberal arts curriculum, at Raymond the integrity of an essential program in the liberal arts is safeguarded by the prescribed three-year course of studies. Yet it is possible in the third year of the Raymond curriculum for the students to be given an introduction to what we call "an area of specialization" that will serve to launch them into a specific, advanced graduate or professional program elsewhere at the fourth year.

A word should be said about the testing and grading system at Raymond College. Here, too, certain innovations are being attempted. The student receives no letter grades. Rather at the end of each term the professors submit to the Dean of Student Life a written statement indicating the student's accomplishment in the course, the areas of strength and weakness, and other observations based on the formal and informal association between teacher and student. A copy of this letter—called the Term Letter—along with comments added by the Dean of Student Life, and perhaps the Provost, is sent to the student with another copy to the parents. The designations—superior, satisfactory, unsatisfactory—are used to emphasize the reports. Thus, you see, we have simplified the conventional A to F grading formula in an effort to bring grades back into better perspective. I believe that the Term Letters, with their fulsome evaluation of the total experience of the student in the college, may be the best single thing we have developed to date. It is possible by the way, for transcript purposes, to extrapolate a grade equivalency from the Raymond grading scale that will satisfy the most crotchety registrar.

Concerning tests and examinations: late in Spring Term of the first year, the student takes the Pre-Intermediate examinations. These are tests in the several areas of the curriculum and they total about eighteen to twenty hours. The student has not had mid-terms or finals in the term courses throughout that first year. To be sure, he has been tested in a variety of ways, but, except for languages and mathematics where a more conventional procedure seems necessary, the student has not had the mid-term and finals hurdles to clear. The report of the findings from the Pre-Intermediate exams is included in the statement sent out for the third term of that year, and the student must demonstrate proficiency in both the comprehensive examinations and his normal course requirements in order to qualify for Intermediate standing. Aside from the evaluation of the test just mentioned, and and the report of the regular Term Letters, the Raymond student works without formal, scheduled examinations in most areas of the curriculum until he reaches the Senior Comprehensives. In the Spring Term of his third year the student takes eighteen hours of examinations which include area exams in the three divisions of the curriculum, a detailed examination in the "area of specialization," and, for students trying for honors, an oral examination.

Other innovations in the methodology and organization of Raymond College include the extensive use of seminars, tutorials, and independent study. Also at Raymond, the faculty is organized as simply as possible within the three classical divisions of the liberal arts and the college has done away with the organization of the faculty and the curriculum according to departments. You can see that we are determined to keep the college as free of rigid educational and pedagogical formalities as possible. We resist the tendency to build up an impersonal, unwieldy administrative bureaucracy in substitution for a close intellectual community. We agree with Harold Taylor that, "It is finally in the individual response of one person to another—whether through books or in person—that the heart of the matter rests."

Please notice that while the relationship to the University's other divisions is characterized by a rather authoritarian and autocratic arrangement, the interior life of the college is exceedingly democratic. The faculty participate fully in the formulation of policy at all levels. Remembering that the total capacity of the college will be about 240 students, with the total faculty numbering 24, you can see that we are small enough for the faculty to sit as a committee of the whole whenever necessary. Indeed, in these formative years, we meet nearly every Wednesday afternoon from 5:00 until 6:30 p.m. We then proceed to the High Table dinner and the special educational or cultural event of the evening. In passing, one of the ways we seek to bring students and faculty together and keep the community intact is to give the faculty members five free meals each week. A college—like an army—marches on its belly. You will also be interested to hear that we have had a few faculty meetings over the two years of our experience that ran from five o'clock in the evening straight through until 10:00 or 11:00 p.m. These have been meetings concerned with academic honors or academic deficiencies in the student body. This intelligence may incline to frighten you off, but I assure you that such vital and substantive participation has established an unusual degree of esprit and rapport within the total community.

There is one other structural innovation that I will take time to mention. Raymond College has only two persons involved in administration—the Provost and the Dean of Student Life—and both of them also do some teaching. This is an attempt, obviously, to keep closer to the students and faculty and strike again at the unfortunate division that so often builds up in these areas. But I wanted to emphasize the way these two administrators work with the general University administration during the "interval of innovation." The lines of authority are set out as follows:

> The Provost of Raymond College works directly with the President of the University, the Academic Vice-President, and the Financial Vice-President on all matters relating to curriculum, faculty, facility utilization, University relationships, and matters of this sort. These administrative officers weigh the interests of the cluster college against the needs and interests of the total University and they see to it that the Executive Policy Committee of the University is informed concerning all appropriate matters. At the discretion of the President of the University, matters arising out of the areas designated, i.e., salaries, etc., may be put before the Executive Policy Committee for review and judgment.
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> The Dean of Student Life of Raymond College works directly with the Dean of Admissions, the Registrar, the Dean of Students for the University in all matters relating to student life. These administrative officers agree to basic policies concerning admissions, re-admission, student records, student behavior, and matters in these areas. It is their responsibility to see that the Student Personnel Committee of the University is informed concerning all appropriate issues. At the discretion of the President, any matter within the jurisdiction of any of these administrative officers may be put before the Student Personnel Committee or the Executive Policy Committee for review and judgment.

Thus you see again that the freedom of the college for the "interval of innovation" is protected by keeping the essential control of the college outside the general University organizational structure. Yet, the life of the innovating programs is kept close enough to established authority and established procedures that information is always available and, at least hopefully, cooperation based on mutual confidence is increasingly established.

In conclusion, while it is too early to make any sweeping claims for Raymond, the experience to date is very encouraging. We have been able to find good faculty members who are able and eager to participate in an innovating liberal arts program. Our students are working sixty hours a week and their morale is high. Attrition is less than elsewhere in the University. Most of the innovations being tested seem to have definite survival value.

Obviously, there are problems. There is a sense in which the Raymond program acts as a critical conscience on the rest of the University. Some tension and plenty of questioning is the result. Unfaltering dialogue launched in goodwill and sustained by respect should carry us safely through the trouble areas. Indeed, the challenges that the cluster colleges bring to each other and to the other divisions of the University should produce growth and health. We think that competition of this sort is a harbinger of good things for Pacific—and may be instructive for other institutions.

Of course the leveling influences are always at work. Some would isolate us, and we must remember that those who dare to lead out have to be willing to go it alone. But we see, glancing over our shoulder, that others are coming along—even Cal is reaching out in the cluster college pattern at Santa Cruz. Then there are those who would swallow us up. The Tiger is the Pacific mascot and that cat could make a meal of little Raymond. We survive by their indulgence, and it is a hopeful sign that they grant us the right to be different and to be self-consciously brash about it. Yet, our autonomy is tenuous. We hope that Kafka's parable of the mouse will not have an application at Raymond:

> 'Alas,' said the mouse, 'the world is growing smaller everyday.... I saw walls far away to the right and the left, and those long walls narrowed so quickly that I am in the last chamber already, and here in the corner stands the trap into which I must run.' 'You need only to change your direction,' said the cat, and ate it up.

Raymond does not want to be bound in the trap or downed by the tiger-cat. We pray for a foretaste of that paradise where the lion and the lamb, the bear and the tiger, the cat and the mouse may lie down together. That would be something really new—and for that day we work.

DEAN E. McHENRY

UNIVERSITY OF CALIFORNIA SANTA CRUZ

The Santa Cruz campus of the University of California grew out of a project that was generally called the South Central Coast Campus. The regents in October of 1957 authorized this new campus, and they directed that a search be made for a site in the five-county area that lies south of San Francisco. This search originally started from aerial photographs and included about 80 to 90 possible sites. This was shortly narrowed down to two. Finally, in 1961, the regents selected the Cowell ranch in the northwest corner of Santa Cruz.

The site itself is very distinctive—2,000 acres of land, about two-thirds of it forested with redwoods, Douglas fir, madrona, live oak, and the other trees that are characteristic of the northern California coast. It is on an irregular plateau that rises from about 400 feet elevation at the bottom end to about 1200 feet at the top end. It is about three miles long and a mile wide. On a clear day there is a fine view of the Monterey Bay lying down below, and across the bay are Asilomar, Pacific Grove, Monterey. In the distance, perhaps 50 miles to the south, the Santa Lucia mountains that stand behind the Bug Sur can be seen. The site is relatively rough but surpassingly beautiful.

The academic plan was developed almost simultaneously with the search for and physical master planning of the site. From the very beginning Clark Kerr, President of the University of California, had asked that at Santa Cruz we work out some method of making the campus seem small as it grew large. He also asked for a campus that would still be up to date in the 21st Century. We were under instructions, however, to develop a campus that was capable of growing to 27,500 students. This "topping out" figure is identical with that at Berkeley and UCLA and the other two new campuses—Irvine and San Diego.

Given the site, the ultimate size, and particularly Clark Kerr's charges, we proceeded to develop an academic plan. It provides for a relatively new form of organization, new in an American state university, but really old in conception. We decided to organize the undergraduate work around a series of undergraduate colleges, all of them liberal arts. They are to be residential, and to be both the center for undergraduate life and the focus of faculty attention.

This is, of course, somewhat like the colleges of Cambridge and Oxford, some of which originated in medieval times. There are certain similarities also to two groups of colleges that are well established in California under independent auspices. I refer to the Claremont group, which began with

Pomona College and to which was added over the years Scripps, Claremont Men's, Harvey Mudd, Pitzer and the Claremont Graduate School. The University of the Pacific likewise has chosen to grow by adding small liberal arts colleges, and already at its Stockton campus there are two of these residential colleges in operation—Raymond and Covell; others will be launched shortly. Our colleges also bear some resemblance to the house plan of Harvard and to the residential college plan at Yale, but we will undertake to provide much more in academic services and instruction within our colleges.

MODULAR GROWTH

So we have adopted a mode of growth which could be called modular. The first college is Cowell College, named after the family that occupied the site for nearly a hundred years. Cowell College will accommodate 600 students and there will be attached some 35 faculty fellows. The college will provide housing for 400 of the 600 students, and will have living accommodations for a dozen members of the faculty. A good share of the classwork of the students will be done within the college. The greater part of the students' social and the recreational activities will take place in this college environment. We plan ultimately to have perhaps 20 of these small, liberal arts, residential colleges, beginning with Cowell and adding four in the first five years and eight in the first ten years. After we make our start with these liberal arts colleges we are going to proceed to organize professional and graduate schools, hopefully modeled after the collegiate plan. We do not want them to grow too large, for we always want to keep a sense of belonging both for undergraduates and graduates, a sense that is often lost as monolithic campuses grow. We expect to open in October of 1965 with 500 students. Approximately 300 of them will be junior transfers, largely from the junior colleges, and 200 will be freshmen. There will be a smattering of graduate students as well. Most of the elementary courses and some of the advanced courses will be offered in the college itself. Instruction requiring science laboratories and demonstrations and elaborate facilities will be conducted in the campus core. The University library will also be located near the center of the campus, and so will certain other facilities that we cannot economically build in each of the colleges. Most of the language laboratories, the chief cultural facilities, the great musical events, and the art exhibits, as well as the graduate and professional work, are to be campus-wide functions.

We have often been asked whether this plan can actually be operated without excessive costs. We have made the commitment that it will cost the state no more per student than campuses of the conventional monolithic type.

RESEARCH AND SANTA CRUZ

We are sometimes asked whether research will have a place at Santa Cruz, and we answer that it will be as important a function on our campus as it is on other campuses of the University of California. But we hope to so arrange the distribution of faculty time that in the process of conducting research we will not shortchange the undergraduate student.

We will have graduate work, a trickle at first, rising—in terms of total enrollment—to about 15 per cent in ten years, and to 40 per cent in twenty-five years.

There will also be professional schools. We expect to offer engineering fairly early—the second or third year—and graduate work in business. Landscape architecture has been allocated to us, and there are increasing possibilities that we will enter into a two-year medical program in tandem with the University of California Medical Center in San Francisco, which would handle the last two or clinical years.

We will welcome commuters. They will belong to colleges and have certain special facilities there.

As to the physical program, construction is well under way, but it is moving more slowly than expected. I have learned that architects have the nine months gestation period of humans; but that of contractors is far longer than elephants. Two buildings are well under way, and the Cowell College complex will soon begin to rise on a beautiful hill overlooking Monterey Bay.

As regards architecture, we will strive for diversity, particularly in the colleges. There are certain elements of the architecture that will be in the same vocabulary. But the first ten buildings that have been authorized will have eight different architects. We have a consulting architect who coordinates and makes sure that there is enough kinship, but we have the bright green umbrella of the forest as a unifying factor for the buildings of the campus.

We have at Santa Cruz an exceptional opportunity to pioneer in higher education. We have a chance to begin again, and we intend to use that opportunity to make sure that each student is recognized and known as an individual. We expect to make all this financially feasible by guarding against the proliferation of courses, and also by making sure that the uneconomical small lecture class is eliminated as far as possible. We intend to concentrate on the two ends of the instructional scale: large well-organized lectures and quite small tutorials, seminars, and pro-seminars, in which there is a very close relationship between student and instructor. I think that in the end our greatest contribution will be the restoration of close association between the teacher and the student. Perhaps, also, we will spark renewed interest in independent study. Students, I believe, are among the best teachers both of themselves and of other students, though requiring some guidance and some inspiration. I hope at Santa Cruz they will find an environment that fosters innovation and experimentation, where the best efforts will be put towards developing the liberal education of the undergraduate and excellent professional and graduate training for the advanced student.

LEO F. CAIN

THE SMALL COLLEGE AT CALIFORNIA STATE COLLEGE AT PALOS VERDES

The California State College at Palos Verdes is one of two California state colleges now in the planning stages. It is scheduled to open in the fall of 1965. There will be at that time eighteen operating campuses in the California State College system. Last year there were over 130,000 students enrolled in the system.

The planning for Palos Verdes began in 1962, with a planning staff of seven, which was increased to ten in the fall of 1963. My report to you today is the result of the work of this planning staff, and represents the cooperative effort of those engaged in academic affairs, student affairs, facilities planning, and business management.

In February of this year the academic plan for this new institution was submitted to the Trustees of the California State Colleges. One segment of this plan is the development of Small College within the framework of the total institution. The main emphasis of my talk is this Small College. However, in order to put this aspect of our total program into context, I should first like to review the salient features of the total plan.

FRAMEWORK FOR THE ACADEMIC PROGRAM

The entire curriculum at the California State College at Palos Verdes will fall within the framework of liberal arts and sciences. The total program, both undergraduate and graduate, is designed to preserve a balance among offerings in the humanities and arts, the social and behavioral sciences, and the natural sciences and mathematics. The curriculum pattern has been designed to insure that every graduate of the college will have pursued a program of studies characterized by both breadth and depth.

Schools and Academic Departments. All instructional departments will be located in one of the following schools: The School of Humanities and Fine Arts, The School of Natural Sciences and Mathematics, and the School of Social and Behavioral Sciences.

Nine departments are planned for the College's opening in 1965. There will be two departments in the School of Humanities: the Department of Fine Arts and the Department of Humanistic Studies which will include instruction in language, literature, and philosophy; four departments in the School of Natural Sciences: mathematics and statistics, biology, physics and chemistry (which includes earth and space sciences), and health and physical education; and three departments in the School of Social Sciences: history and political science, economics and geography, and behavioral sciences (which includes several disciplines, thus avoiding a large number of one-man or two-man departments). These departments will function at both the undergraduate and graduate levels.

The Undergraduate Program. The undergraduate program is based on the principles of curriculum balance, and has been designed to insure both adequate breadth and depth in every student's program. The pattern for all students consists of four segments:

1. A program in Basic Studies—absorbing about 40 per cent of the work toward the degree.
2. A major in a traditional discipline—approximately 20 per cent.
3. A major in an interdisciplinary field—approximately 20 per cent.
4. Elective courses—approximately 20 per cent—which will give opportunity for enrichment in general education, greater depth in specialized studies, and the start of professional sequences (*e.g.,* for a teaching credential), as needed.

This bachelor's degree program pattern will apply to all students—whether terminal, or continuing with graduate work in an academic discipline, or continuing with a fifth-year professional program.

The Graduate Program. On the graduate level, the College will offer work in the traditional disciplines through the various academic departments, and will offer work in professional study and in academic interdisciplinary fields through graduate institutes.

One of the important functions the graduate program of the College will undertake is the preparation of college teachers, which is stressed in the *California Master Plan for Higher Education.*

Student and Faculty Course Load. The College will operate on the quarter system. In the light of the emphasis on both depth and breadth and in view of the program structure, the most functional student load will be four courses per quarter. Thus, most of the course offerings will be planned at four units, with certain courses and seminars occasionally exceeding or falling below that number. The course load for full-time faculty will be three courses per quarter.

The Basic Studies Program. Designed to fulfill general education objectives, the Basic Studies Program will consist of eighteen four-unit courses—six in each of the three broad fields of knowledge, *i.e.,* humanities–arts, mathematics–natural sciences, and social sciences. One course in each field is to be taken in the upper division. All of these courses will be structured specifically to meet the ends of general education and will not, in any direct way, meet specialized or professional goals.

Dual Fields of Concentration: Disciplinary and Interdisciplinary. College faculties everywhere are finding increasing difficulty in designing curricula so that every student's program is characterized by both breadth and depth. They point out that the problem has been aggregated since World War II by the tremendous explosion in knowledge.

Academic planning has been further complicated because many of the lines separating traditional fields of knowledge have broken down. In area studies programs, space science, biology, behavioral sciences, and linguistics—to name only a few fields—traditional discipline boundaries are largely ignored at the point where the most fruitful research is being done. The planning staff at the California State College at Palos Verdes believes that this new role of the interdisciplinary approach in the world of research must now be reflected in curriculum planning.

The planning staff has therefore sought a curriculum pattern which joins the disciplinary and interdisciplinary approaches. When the two are joined, a pattern emerges, which not only provides for depth in a single discipline, but also requires the breadth of perspective which specialized study in a single field does not often give. The plan, therefore, calls for the development of two types of majors, both of which are to be required of all students: one in a discipline field and one in an interdisciplinary field.

Major fields in a discipline become the responsibility of a single department while the interdisciplinary major fields become the responsibility of groups of departments. Examples of discipline majors include: English, Spanish, chemistry, mathematics, economics, and geography. Examples of interdisciplinary majors include: American studies, earth and space sciences, Latin-American studies, and linguistics.

THE PLAN FOR THE SMALL COLLEGE

During recent years several large colleges and universities have established, or are in the process of establishing, small undergraduate experimental colleges on their campuses. The California State College at Palos Verdes is also planning to establish a small, undergraduate experimental college.

The plan for the Small College at Palos Verdes is the first program of this sort in the California State College system. Our studies of programs in higher education indicate that Palos Verdes is the first institution in the United States to incorporate plans for a small experimental college on its campus within the total plans for a large, as yet non-existent, institution. In the case of such experimental ventures as Monteith, or New College at Hofstra, or Raymond, the mother institution was in full existence at the time the experimental college was conceived. In this case, however, both institutions are being planned together.

The rationale for establishing this experimental college on our campus was to develop an undergraduate program with a liberal arts emphasis. Our studies in academic planning revealed a number of factors that merited careful consideration in order to accomplish this:

1. A new institution, which is destined to become a large campus complex, can develop the means only during its initial phases for maintaining complete flexibility. With rapid growth, sooner or later these means must become institutionalized. A small college can, however, remain flexible, and it is within its framework that innovation in academic planning can be tried and tested without disturbing the total pattern of the large institution.

2. The large state college or university of tomorrow, with its increasing emphasis on graduate programs, will undoubtedly find itself recruiting faculty, distributing funds, and assigning its best administrative talent to the graduate level. This seems almost inevitable if the best graduate programs are to be developed and maintained. This process often has as its by-product the neglect of the undergraduate program. The presence of a small college, concentrating its creative force on the undergraduate curriculum should serve as a significant influence for better balance.

3. The undergraduate liberal arts college has been a major force in American education. In public education, however, it seems to be on the decline. In three states where the most rapid development is being made in higher education—California, Florida, and New York—a vast number of college students are now following a new pattern—two years of post-high school work at a two-year college followed by upper division and graduate work in a large state institution. Before this pattern becomes a norm in all of public higher education, some steps should be taken on large college and university campuses to preserve the diversity of pattern which has characterized American education in the past and which continues to be a desirable feature. The small liberal arts undergraduate college established on the campus of a large college will contribute toward preserving diversity.

Our college is still in the planning stage, and the Small College is not scheduled to open until 1969, four years after the total college opens. At that time, the total student enrollment in the college is projected at about 4500 students. It is therefore understandable that, while we have already set the principles which will govern the organization and operation of the Small College, most of the operational specifics are yet to be worked out. However, trial programs have been developed which indicate that the following ideas are operationally feasible. I shall enumerate them under these major headings: student body, faculty, programs, administration, and physical facilities.

Student Body. The student body of the Small College will as closely as possible preserve the variety of socio-economic backgrounds and the range of abilities and talents present in the population of the total college. Our Small College is not intended to be an honors college. We recognize that the Small College population will probably never be a perfect sample of our total undergraduate student body, but every means will be taken to preserve in it the variables and ranges present in our total population and the characteristics we consider significant: age, socio-economic and cultural background, verbal and quantitative competence, and professional and educational objectives.

The student body will be small. The ceiling is set for 500 total, with approximately 200 new students admitted each year.

Faculty. The Small College will have a faculty of men and women specifically selected for their excellence as undergraduate teachers. Three criteria will be used in the selection process of recruiting of staff:

1. Excellence in teaching;
2. Depth and originality of thought in the chosen field of study and in the means by which its major concepts can be best transmitted; and
3. Demonstrated interest in, and understanding of, students.

The faculty will be employed specifically in the Small College, although arrangements may be made on an individual basis for Small College faculty members to teach in the regular college. While joint appointments may be made, they would be made under exceptional conditions. The student-faculty ratio in the Small College will approximate that for the total college.

Program. The Small College will operate year-round, offering curricula leading to the bachelor of arts degree in three years. Students selected will be expected to follow this calendar. Registration for the Small College will take place only in the autumn quarter; thus duplication and proliferation of courses will be avoided. It should be noted that, although the California State College at Palos Verdes as a whole is being planned for year-round operation on the quarter system, the bachelor's degree offered there is not being conceived of as a three-year degree.

Every student's program will be individually planned through student-advisor conferences. No blanket bachelor's degree course requirements will be set for Small College students. However, the bachelor's degree requirements set in the State Education Code will be met.

In general, we expect that 40 per cent of the program will be devoted to basic studies and 40 per cent to specialized studies. Further, we expect that the student's specialized studies will include work in a discipline as well as in an interdisciplinary field. However, the faculty will be encouraged to experiment with various patterns.

Moreover, the Small College faculty will be free to engage in a variety of experimental projects involving new instructional concepts. It will almost certainly explore such ideas as independent study, credit by examination, programmed learning, and freshman and senior seminars. Each experimental project will be considered by the total Small College faculty before it is undertaken. Regular faculty meetings will be held to hear progress reports of these projects and periodic reports in some form will be transmitted to the total faculty of the College. Experimental programs which hold promise for the total college will be tested in the Small College. This will improve the chances of success in the institution as a whole.

The Small College will help to prepare college teachers working in co-operation with the graduate school. The Small College classes will be used for observation experiences, and the Small College will provide internships to graduate students preparing to teach.

Students will be permitted to take courses outside of the Small College. It would be inefficient to offer certain high cost, or low enrollment courses in two places on the campus. Small College courses, however, will not be open to other students.

The proportion of the work which a student would be permitted to take outside the Small College will not be specifically regulated, for the exact proportion would differ with each student. This will be decided when the student's program is planned.

Administration. The Small College will be under the direction of a dean responsible for both curricular matters and student affairs. He will report directly to the vice president for academic affairs and will work closely with the deans of the other schools and with the dean of student affairs. One of the basic principles in the organization of the Small College is that no separation will occur between academic and student affairs, areas usually separate in larger institutions. Perhaps in this as in other ways, the Small College will prove more economical and efficient than larger institutions with more administrative personnel.

General college regulations, such as those regarding probation and dismissal, will apply to the Small College.

The backbone of the Small College will be the advisory system. Every faculty member will serve as an advisor, and each student will typically remain with his advisor throughout his three years.

Physical Facilities. The Small College will be housed in the initial buildings of the California State College at Palos Verdes. These buildings have been specifically designed for easy conversion to the Small College when it opens in the fall of 1969. The facilities will contain adequate classrooms and laboratories, faculty offices, administrative offices, and facilities for seminar groups, as well as for larger groups of students. The Small College will not have separate student records, its own library, or its own eating facilities. When dormitories are constructed on the campus, dormitory space, with separate lounge facilities, will be reserved for Small College students living on campus. Thus, the Small College will make maximum use of the general facilities of the institution.

CONCLUSION

The planning staff of the California State College at Palos Verdes look forward to this venture. Every effort will be made to work out a program which will give students completely individualized attention at no significant additional cost over conventional programs. We are seriously concerned about maintaining flexibility of the Small College as the larger campus grows. In an institution like this, with a rapid growth in enrollment projected, such a program as is represented by the Small College will be a safeguard for faculty and administration. It will serve to keep us abreast of the newest trends, provide opportunities to observe these trends in action, and keep our institution in the forefront of educational development.

The primary objective of our planning staff is to work out a curriculum and a co-curricular program for our college that is not an assembly line and will not produce tens of thousands of standardized students. We cannot say now with certainty that we will succeed in this overwhelming task, but we are expecting the Small College to teach us some ways of doing it.

SECTION III

Programmed Instruction

W. JAMES POPHAM

PROGAMMED INSTRUCTION: A NEW DIRECTION

In an article, "The Changing Face of Programmed Instruction,"[1] which I wrote two years ago, I examined the changes that had taken place in the field of programmed instruction since approximately 1958 when the interest in this movement began. In many ways that topic is comparable to the one which I am treating here. As I look back now, I would be obliged to repudiate many of the points of view taken in that earlier paper.

In the concluding section of that article, I wrote the following:

> One suspects that if a similar article were to be written two years from now, the "changing face of programmed instruction" would once more be so seriously altered that it might indeed be unrecognizable.[2]

This prophesy, I believe, was in error. The face of programmed instruction is still recognizable. Many of the same elements that were present in 1962 are with us in 1964. It would be safe to assert, however, that the face of programmed instruction is perhaps turning in a new direction. I should like to examine the nature of this change.

BASIC ELEMENTS OF PROGRAMMED INSTRUCTION

Most of you are familiar with the basic concept of programmed instruction, but for those few who might not be conversant with it, let me very briefly summarize its major elements. Programmed instruction evolved primarily from the arguments of Harvard's B. F. Skinner concerning the possibility of introducing animal, laboratory, behavior-shaping principles into the classroom learning siutation. In the early days of this movement, a program was considered a set of instructional materials which was presented to the learner in carefully sequenced or programmed steps. It required the learner to make active response, informed the learner whether his responses were correct, and allowed the learner to move to some extent at his own pace. In those days, the teaching machine was typically associated with this approach. While a program could be presented in ordinary book format, it was more often assumed that some kind of mechanical contrivance would be used to present the instructional material.

1958–60 DIRECTIONS

If there is a new direction in programmed instruction today, what was the old direction? What was the state of programmed instruction in the beginning? Skinner had written an article[3] in 1954 which attracted considerable attention among experimental psychologists. But interest among educators and the public was not aroused until he wrote, in *Science* magazine in 1958, that some kind of mechanical instrumentation or teaching machine could best be used to provide the reinforcement patterns necessary to shape human behavior.[4] Public interest grew in 1958, 1959 and 1960. Every popular magazine, ranging from *Saturday Evening Post* to *Playboy,* carried articles on teaching machines. "Will Machines Replace Teachers" was a common theme, for the idea that machines could teach human beings was controversial and provocative.

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[1] W. J. Popham. "The Changing Face of Programmed Instruction," *California Journal of Elementary Education*, Vol. 31, No. 2. November, 1962, pp. 112–123.

[2] *Ibid.*, p. 123.

Yet, persons working in programmed instruction realized that, in spite of the flurry of accounts on the subject, few of the raw materials necessary to implement this method were actually available. Teaching machines and instructional programs were almost as hard to find as educators who knew very much about them. A national survey conducted in late 1960 indicated that only five different teaching machine models were in production by commercial firms, and programs for them were almost as scarce.[5]

It was virtually impossible to locate adequate resource material on the fundamentals of programmed instruction. When the long awaited first book of readings in this field, edited by Arthur Lumsdaine and Robert Glaser,[6] was finally published by the National Education Association in late 1960, it created an incredible stir in programmed instruction circles.

From 1958 to 1960, few colleges or universities considered the possibility of giving courses dealing exclusively with programmed instruction. There was very little demand for such courses, but even if demand had been enormous, few universities had professors who knew enough about the field to teach them. It would be fair to say that early in this movement many educators were often suspicious and sometimes downright hostile toward "those mechanical teaching gadgets."

1960–62 DIRECTIONS

While public interest waned, professional interest grew and many educators entered the field of programmed instruction. The National Society for Programmed Instruction blossomed from a handful of members to a professional group boasting hundreds of members.

The number of programs and teaching machines increased greatly. Many of the early programs were purchased primarily because they were unique. For example, the first commercially produced program in English grammar sold well over 100,000 copies, in large measure due to the fact that it was simply the first. During 1960–62 a number of programs went on the market and materials became available in diverse fields, many of them suitable for junior college instruction. The number of books and intensive articles on the topic increased tremendously.

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[3] B. F. Skinner. "The Science of Learning and the Art of Teaching," *Harvard Educational Review,* Vol. 24, Spring, 1954, pp. 86–97.

[4] B. F. Skinner. "Teaching Machines," *Science,* Vol. 128, October 24, 1958, pp. 969–77.

[5] J. D. Finn and D. G. Perrin. "Teaching Machines and Programmed Learning, 1962: A Survey of the Industry," Occasional Paper No. 3, Technological Project (University of Southern California, January, 1962).

[6] *Teaching Machines and Programmed Learning; A Source Book,* edited by A. A. Lumsdaine and Robert Glaser (Washington: Department of Audio-Visual Instruction, National Education Association, c1960).

From a curricular point of view, many colleges had begun to offer regular courses, extension courses, and workshops in the field of programmed instruction. Through a survey in early 1962, I discovered that more than 100 major colleges and universities in this country were offering or planned to offer courses dealing specifically with programmed instruction.[7]

The attitudes of educators had also been altered. With increased knowledge, fewer teachers viewed automation as a threat to their existence. Rather, they began to look upon this innovation as another tool in instruction. While some negativism resulted from the outlandish claims of a number of teaching machine manufacturers and program companies, there was a general shift toward the positive in educational attitudes on programmed methods.

It became clear that there should be an enduring emphasis upon the desirability of seeking specific instructional objectives. While men and women who teach by conventional methods are apt to state their objectives in rather nebulous and broad terms, programmers, many of whom have had considerable background in behavioral psychology, demand that their terminal objectives be stated in terms of learner behavior. This stress upon behavioral objectives remained constant through 1960–62, and was greatly emphasized by the publication of an excellent programmed text on preparation of instructional objectives.[8]

1962–64 DIRECTIONS

It would seem that most of the predictable changes in programmed instruction occurred in the period 1960–62. But what about the past two years, from 1962 to 1964? What has happened to programmed instruction?

The very definition of a program itself has been altered—a striking change in direction. You will recall that the earliest conception of programmed instruction required that a student respond frequently to carefully sequenced instructional material, that he receive knowledge of results regarding the appropriateness of his responses, and that he move to some extent at his own pace through the material. This conception has definitely been changed. In the most recent yearbook of the National Society for the Study of Education, Professor Arthur Lumsdaine offers a new definition, saying that a program is any set of reproducible instructional events which takes the responsibility for changing the student's behavior.[9] The effectiveness of the program is measured by whether it changes behavior, which is clearly the function of the program. This definition of the program does not require individual instruction, nor small steps, nor active response, nor knowledge of results. In other words, the emphasis is upon the *effect* produced by this reproducible sequence of instructional events. Many teaching films, for example, might now be considered as programs. If a tape recorded lesson aims at some behavior change, it could be considered a program. This redefinition of a program has received considerable attention and support.

This new definition emerges from a far greater reliance on external evidence for determining whether a program is really efficient. It is a definition far less restrictive than the earlier notion of programmed instruction. No longer do programming "experts" believe they are sufficiently competent to examine a program and tell whether it is effective. The work of the joint committee of the American Education Research Association, the American Psychological Association, and the Department of Audio-Visual Instruction of the National Education Association strongly supports the notion that we must use external criteria, that is, empirical evidence, to determine whether a program is successful.

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[7] W. J. Popham. "College Courses in Programmed Learning," *AID*, Vol. 1, March, 1962, pp. 107.

[8] Robert F. Mager. *Preparing Objectives for Programmed Instruction* (San Francisco: Fearon Publishers, 1962).

[9] A. A. Lumsdaine. "Educational Technology, Programed Instruction, and Instructional Science," in *Theories of Learning and Instruction*, Chapter 16, N.S.S.E. Yearbook, Part 1, 1964, pp. 371–401.

This new conception of programming, with its emphasis upon ends somewhat less than means, leads to a variety of different kinds of approaches. For example, educational films, educational television, and multi-media approaches can now be used with groups of students rather than with one individual and still be called programs. The ability to replicate instructional events makes it possible continually to revise and improve the quality of instructional materials. This is not possible with conventional approaches.

Another very significant change in the direction of programmed instruction has occurred in regard to the teaching machine. The teaching machine in its more simple manifestations is only a program holder. It did prevent the student from cheating and perhaps produced a certain amount of "pin ball effect" that was useful. But these simple teaching machines have largely passed from programmed instruction. But some experts are still advocating the more complex machines, particularly computer-based devices because of their tremendous adaptive capabilities.

Another interesting trend which is just beginning to be developed is the automation of the teacher. Recently McGraw-Hill Company has produced a series of reading programs for first grade pupils. Since the first graders are nonreaders, the teacher must play a primary role at the beginning of the instruction. The program requires that the teacher read from a script. She may not eliminate any of the material from the script, but can add to it. This script is programmed to the point that the teacher's behavior becomes somewhat reproducible and can be tested and improved.

The quality of programs, both in terms of content and appearance, has been improved in recent years. Some of the early programs were poorly presented and unattractive. Today the programs are far more visually pleasing and interesting.

Educators have continued to grow more positively favorable toward programmed instruction as evidence of effectiveness has accumulated. While some may be discouraged by some of the relatively poor programs, the potential of programmed instruction is obvious.

Most of the programs today are produced by the major publishing firms. Although there are still a few organizations which are associated with film producers or testing firms, these represent only a modest proportion of the program-producing companies.

Europe, incidentally, is at about the stage we were in 1959 or 1960. There is currently substantial activity in some of the European countries regarding teaching machines.

A final new direction which we are witnessing in the field of programmed instruction can be described as "curriculum concern." Some people are becoming very disturbed that programs might not teach the right things. As programmers increasingly demonstrate their capabilities to achieve their instructional goals with efficiency, many educators are with good reason deeply concerned about the appropriateness of the objectives which are selected in the first place.

I have attempted to examine some of the new directions in the field of programmed instruction. The new image of programmed instruction is that of a rigorous, empirically-based instructional technology, more receptive to innovation than it was a few years ago, and more thoroughly committed to judging the quality of instruction in terms of the behavior of learners. This is, I believe, a thoroughly laudable new direction.

CARL H. HENDERSHOT

PROGRAMMED INSTRUCTION IN IMPROVEMENT COURSES AT DELTA COLLEGE

Large numbers of persons have the potential ability and the will to study at the college level, but cannot qualify for admission because of inadequate preparation. At Delta College, University Center, Michigan, courses in the Improvement Division are designed to prepare such students for admission to freshman courses. Programmed instruction is of central importance to this plan.

The subject matter of improvement courses is new for some individuals and a review for others. These facts, when combined with the varying aptitudes of individuals, present patterns of different and complex needs. Instruction by means of programmed texts is varied to better adapt to these needs. Performance tests permit the exclusion of work on materials already mastered, while additional units of instruction provide enrichment when desired.

The individual progress and independent learning facilitated by programmed instruction permits the completion by some individuals of more than one course per trimester. At the same time, no repetition of completed material is necessary when a student requires more than one trimester in order to complete the work of a single course.

Since the student is less dependent upon the instructor in a programmed learning situation, a major portion of the instructor's time is available for tutorial assistance. Thus, programmed instruction helps to provide for economy in operations and attention to individual problems.

PROGRAMMED INSTRUCTION IN MATHEMATICS

Through the use of teaching aides (to administer and correct tests and handle routine clerical tasks), we have found it possible for an expert professor to serve mathematics classes with two or three times the normal enrollment. Here, the professor has more contact with the student than in traditional classroom situations.

To provide additional explanations and reinforcements via another medium, we have developed video tapes for use with programmed texts. These tapes are used to supplement other presentations.

In our mathematics improvement courses, a student moves from one unit to another upon the successful completion of unit tests.

Each trimester small numbers of students complete two courses within the 15-week period, and occasionally a student completes three successive courses in mathematics. However, most students require the full trimester or more for each course.

The diligent student can advantageously progress rapidly through the work of a pre-freshman course and, by continuing in programmed learning texts, may complete a college course for credit. Payment of a fee for only one course is required. This is accomplished by a few students each trimester.

It is also permissible for a student who is failing a freshman course to transfer to a programmed improvement course prior to mid-trimester. This helps to prepare the student for the freshman course with the least possible delay.

As a significant result of this program, some students who were mathematical cripples are now finding it possible to enter professions which require mathematics. One example is a young man who is now a "B" level student in engineering at a leading university. Because of his previous low achievement, this youth entered the programmed basic mathematics course and then proceeded through programs in algebra and geometry.

As might be expected, the best results in these courses are obtained by the mature and diligent students who discipline and apply themselves to concentrated learning situations.

In cases where we have had low enrollments in summer or evening classes, we have been able to serve the few students concerned by permitting them to meet with another programmed mathematics class. Both plane and solid geometry have been taught in this manner. We have also combined two programmed courses successfully.

PROGRAMMED INSTRUCTION IN OTHER FIELDS

Programming has provided interesting and flexible supplements to our filmed courses in chemistry and physics. In these courses, the programs are supplementary to materials presented via closed circuit television. Here programmed texts are used for review, reinforcement and to fill in gaps in the foundations required for success in the course. Under the guidance of an instructor who has many programs conveniently available, this technique permits the time of the student to be concentrated upon the areas of study best suited to his needs.

In the study, reading, and English courses, programmed learning units are key parts of the required content. Programmed texts make provision for the rapid and effective learning of grammar and vocabulary and contribute to variation that best serves the needs of each student. The combination of programs, and other self-pacing media, with individualized assistance in theme writing and other problems presents a service which is efficient, effective and economical in terms of both student and professional time.

Progress in the reading courses is on an individual basis and involves the use of programmed learning and controlled reading machines. Skills in learning more efficiently from lectures or books are developed through audio-tape materials correlated with programmed learning type workbooks.

STUDENT ACHIEVEMENT

As an aid to evaluating the effectiveness of our work, we study the grades students achieve in the college courses.

Representative of the studies we have made is one in the field of English. Students who are required to enroll in both English 51 (reading-study) and English 72 (basic English) have very low achievement. During 1963–64, we found, however, that 84 per cent of the 209 students who had completed the improvement courses in English made passing grades (nine per cent, B; 50 per cent, C; and 25 per cent, D) in their college-level English courses.

Our findings in mathematics are similarly encouraging. As a matter of fact, during 1963–64, all students who completed improvement courses in mathematics passed the college courses in the fields they later pursued.

The facts point out that at Delta College we are making it possible for many students to prepare for success in college study. We are preventing failure and placing new educational and vocational opportunities within range of achievement for large numbers of students.

PROGRAM RESOURCE CENTER

In a special room in our college library we have a collection of more than 500 programs in a multiplicity of fields. Professors in varied fields frequently refer students, with special needs or interests, to the program resource center for self-study. Likewise, students on their own initiative use programs for individual, independent study.

Our library is also shared with the community through a rental plan administered by the Division of Continuing Education of Delta College. Under this plan, the enrollee receives professional assistance in the selection of a series of programs which best meets his needs. Then he studies on his own, moving from one unit to another at will. The enrollee has the privilege of completing his study in one subject area and moving to another within the duration of his enrollment.

Adults are using this facility for job upgrading, for review and refresher study, and for self-enrichment in areas of a vocational interest. English, chemistry, mathematics, general science, electricity, and foreign languages are areas of study often requested. Men who travel or who have jobs which prevent regular class attendance, and mothers with small children, appreciate this opportunity for self-instruction.

The chance for independent and review study encourages some adults to later enroll for college credit.

CONCLUSION

Programmed learning helps people help themselves. By eliminating the gaps in instruction, as well as nonteaching trivia from the textual material, programmed instruction encourages learning and comprehension. Many now find learning a more successful and rewarding experience. With the elimination of burdensome educational deficiencies, these persons are not only prepared but are encouraged and challenged to seek further education and training.

For those who possess both the ability and the will to learn, well written programs offer a challenging opportunity for academic achievement. The addition of the assistance of a master teacher, class competition and course achievement standards creates an atmosphere which challenges the individual to his best efforts.

EDWARD SIMONSEN

PROGRAMMED INSTRUCTION AS AN AID TO KEEPING THE DOOR AJAR IN THE OPEN-DOOR COLLEGE

There are means, in spite of many pressures and problems, for junior colleges to remain comprehensive, serving all who aspire to post-high school education. Programmed instruction can be helpful in fulfilling the junior college's total mission, and should not be considered exclusively as a tool of remedial instruction. It is in this spirit that the use of programmed instruction at Bakersfield College has been viewed.

Following is a review of experimentation in programmed instruction that we have conducted at Bakersfield College, some programs in current use, and some future possibilities.

EXPERIMENTATION

One of our early experiments concerned the use of a program for technical mathematics. Experimentation with that program, while not conclusive, suggested to us that such material could be taught through use of our Auto Tutor.

More recently, we experimented with the basic electronics program provided by Western Design for use in the Auto Tutor. The plan we followed is described in some detail by John J. Collins in the October, 1962, issue of the *Junior College Journal*.[1]

We determined through control and experimental groups that the experimental group, substituting programmed material for lectures and attending laboratory sessions, was able to achieve as ably as the students who were enrolled in the conventional lecture-laboratory course in basic electronics. While the experimental group did not gain any measurable advantage, neither did it appear to be penalized by use of the machine instead of the lecture. Students participating in the experiment were enthusiastic, especially because it allowed them to proceed at their own pace. They were able to take better notes, partly because the machine never got "sidetracked." They liked the program's analysis of errors. In short, both from a curriculum viewpoint and from the perception of students, the use of the basic electronics program was successful, and we are using it as a continuing supplement in the course.

PRESENT USE

In electronics, we are using as a regular supplement to other instruction the program with which we have previously experimented. Students check out the film from the audio-visual center in our library for use at their own rate of accomplishment, on their own time, outside of class.

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[1] John J. Collins. "An Experiment in the Use of Teaching Machines." *Junior College Journal*, 33:73–77. October, 1962.

A program on computer programming is also being used as a supplement to our elementary course in business data processing for technical students. More advanced films are available for later use.

In nursing education, we have found programmed instruction helpful in permitting certain students to review their mathematics preparation, particularly for pharmacology. In the tightly timed course of study in nursing, teaching machine provide a flexibility most appreciated by the carefully selected, highly motivated students in that field.

FUTURE PLANS

Looking ahead a bit, our nursing department is strongly considering the possibility of using the already well established *asepsis* program which was developed at Teachers College, Columbia University.[2] The testing of this program has received wide recognition in the field.

Also in our nursing department, we will soon be involved in another experiment conducted by Teachers College, Columbia University, on the *administration of oxygen.* Again, as in the case with *asepsis,* the program covers one unit, rather than a total course. We think there is great potential in this area.

Next year our engineering students will use programmed instruction in computer programming.

A number of our staff members have been interested in using programmed texts in remedial English. One of our instructors, as a matter of fact, is surveying a number of programs this summer as a part of a degree program. She will report her findings to the English department this fall. She is also tentatively reviewing the possibilities of the newly published text called *Programmed English*[3] by M. W. Sullivan, particularly because of the author's extensive background in modern languages and programming. The book was field tested here in California. In remedial English, the same instructor has noted the possible use of a vocabulary unit using the Coronet Learning Program called *Vocabulary Growth.*[4] She reports a feeling that the self-pacing attribute of the programmed text is its greatest advantage. Since the amount of learning appears to be about equal between experimental groups and conventional groups for remedial students, the self-pacing may result in a considerable difference in student attitude.

In summary, at Bakersfield College we have experimented with programmed instruction and have made it a supplementary instructional device in several fields. We are planning to expand the areas in which it will be used during the coming years. We do this with the conviction that we are committed to keeping the door open to a wide range of students and we must, therefore, make use of all media of instruction that stand the test of careful scrutiny. Programmed instruction, in our opinion, qualifies, and we suggest that junior colleges should continue to experiment with and use programmed materials where they are appropriate.

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[2] Marie M. Seedor. *Programmed Instruction for Nursing in the Community College.* No. 4 of the Nursing Education Monographs (New York: Bureau of Publications, Teachers College, Columbia University, 1963), p. 17.

[3] M. W. Sullivan. *Programmed English* (New York: The Macmillan Company, 1963), 1783 frames.

[4] *Vocabulary Growth: Divide and Conquer Words.* Programmed by Learning Incorporated for Coronet Instructional Films (Chicago, 1962), 339 frames.

ALLAN C. KELLER

THE STUDY SKILLS CENTER AT LOS ANGELES VALLEY COLLEGE

The Study Skills Center was conceived from two needs observed in counseling: (1) We noticed that while many students had general overall ability, they were deficient in certain subject areas or in certain units within subject areas. (2) Many students need improvement in study habits—how to take notes, how to study for exams, how to prepare research papers.

Programmed learning and teaching machines seemed a possible solution to the first problem. In the 1962 spring semester, Valley's guidance staff formed a three-member committee to explore the use of programmed learning in a study skills center.

After a semester of planning, which included consultations with specialists in the field of programmed learning, the Study Skills Center opened in temporary quarters October 12, 1962. In the 1964 fall semester, the Center will commence its third year of operation. Starting with six teaching machines and eight programmed lessons, the Center now has 25 machines and 80 lessons.

PHILOSOPHY AND PRINCIPLES

The core of the Study Skills Center is guidance. Conceived, planned and administered by members of the guidance staff, the Center is interested in students' problems. We feel that counselors are best equipped to operate the Center. When a student arrives at the Center, the counselor helps him decide whether he needs specific programmed lessons, attendance at the Study Habits Workshops, or personal counseling. In the case of the latter, he is referred to the guidance office for an appointment with a counselor.

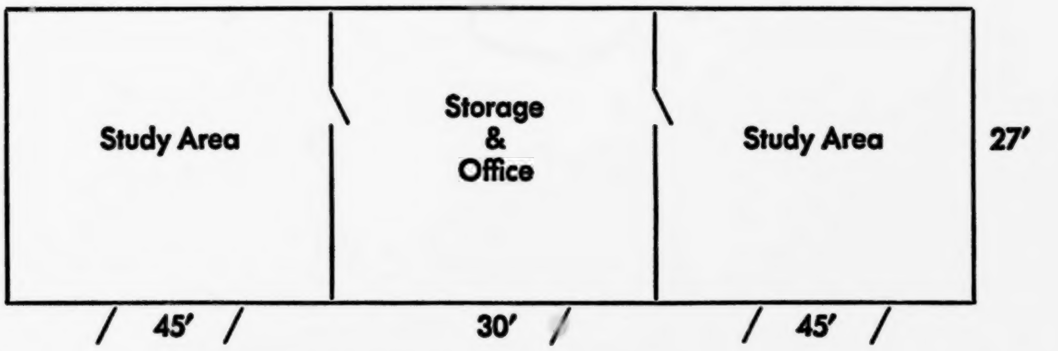
Many students enroll in both programmed learning and the Study Habits Workshops. Every effort is made to diagnose students' needs and to work out a regular program of specific hours during the week for students who are referred to the Center.

Several principles have guided the operation of the Center:

1. For the most part, students attend through:
   a. Referral by instructors.
   b. Referral by members of the counseling staff.
2. Students may also enroll by self-referral.
3. Students enroll at the Center for definite hours during the week for as long a period as they wish during the semester. Most students enroll for two to three hours a week, but they may take additional time.
4. There are no grades or credits.
5. Students maintain their own records.
6. A counselor is on duty to assist students at all times.

PHYSICAL HOUSING AND EQUIPMENT

The Study Skills Center was originally housed in a two-room temporary frame building. In February, 1964, the Center moved into its present quarters (also a temporary frame building) with 3,240 square feet and three rooms. Valley College recently received approval for a $400,000 expansion of its Library facilities. Included in these plans are a permanent Study Skills Center with an area of 5,000 square feet. Proposed expenditures for equipment and supplies are listed elsewhere in this paper. It is planned to equip the new Center with individual study carrels and electronic teaching machines, in addition to hand operated machines.



PRESENT STUDY SKILLS CENTER

The central room above serves for storage of programmed materials and teaching machines and for student conferences. The doors to the study areas can be closed to provide a quiet atmosphere for learning. One of the study areas also doubles as a Study Habits Workshop.

The Center has 15 Grolier Minmax teaching machines which cost about $20.00 each. The Grolier Minmax is a hand-operated machine. A Mast Teaching Machine which is electrically operated and uses programmed cartridge tapes, has been ordered for September.

In addition, the Center has a foot-controlled tape recorder for use with foreign language tapes and programmed texts. In the field of reading improvement, the Center uses two Craig Readers and seven SRA Reading Accelerators. Two more Craig Readers have been ordered for September, 1964. Most of the Center's programmed lessons are in text form and the Center now has over 80 different programs.

Present inventory, "on order," and projected costs are indicated below:

EQUIPMENT AND SUPPLY BUDGET

(Does not include cost of projected study carrels and furniture)

	Inventory June, 1964	On Order	Projected Expansion (Addition to Library)	Total
Teaching Machines	$1,039.00	$ 600.00	$15,384.00	$17,023.00
Related Tapes, etc.	480.00	505.00	6,446.00	7,431.00
Programmed Texts	1,969.00	910.00	6,000.00	8,879.00
	$3,488.00	$2,015.00	$27,830.00	$33,333.00

STUDY HABITS WORKSHOPS

The Study Skills Center actually has two divisions: (1) The Self-Tutoring Laboratory, which utilizes programmed lessons and teaching machines, and (2) The Study Habits Workshops—seminars conducted by counselors.

The Study Habits Workshops were patterned after similar workshops conducted at UCLA. At Valley College, a combined discussion and workshop method is used. Students attend the workshops one hour twice weekly for eight weeks. From 40 to 50 students have attended the workshops during a semester. Groups of eight to twelve students have proved to be the most manageable number.

An outline of topics is followed during the eight sessions, though the counselor conducting the workshop is allowed flexibility according to the needs of the group. The following are among the topics covered:

1. Preparing a study schedule
2. Writing suitable lecture notes
3. Studying for exams
4. Increasing reading speed and comprehension
5. Preparing research papers

The first two sessions of the workshops are devoted to the preparation of a study schedule. Criteria for a suitable schedule are discussed, and provisional schedules are prepared. After a tryout period, students may revise their schedules where necessary.

A follow-up study of students attending Valley's workshops in the 1962 fall semester showed that, for the most part, these students had improved their grades.

ORIENTATION OF STUDENTS

The following steps are followed with students who arrive at the Center for the first time:

1. In many cases, the student will bring a referral slip from his instructor indicating his specific difficulty. For example: Subject, Beginning Algebra. Difficulty, "exponents."

2. If a student indicates difficulty with a subject, his problems are diagnosed through a pretest. If it appears that the student needs assistance in his study, he is referred to the Study Habits Workshop.

3. Before the student is given any programmed material he is asked to read an orientation sheet which explains the principles of programmed learning and procedures governing his enrollment and attendance at the Center.

4. A programmed lesson is selected which will meet the student's needs, as determined by the counselor.

5. The student is shown the rack where he may insert enrollment cards in slots for the hours he wishes to attend. He is encouraged to attend a minimum of two to three hours a week. The card also has spaces for him to record the lessons completed. The cards have different colors for different types of subjects and teaching machines.

6. The student is shown unit pretests and posttests by which he can measure his progress.

7. After the first session, the student automatically takes his card from the rack as he enters the Center and returns it at the end of the hour.

8. If a lesson is to be used in a teaching machine, the student is taught how to operate the machine.

9. Each time the student attends the Center, he obtains his programmed lesson, and then returns it to its place at the end of the hour.

STUDENT AND FACULTY RESPONSE

We have been encouraged by the response of students and faculty to the Study Skills Center. Attendance at the Center increased from 147 students its first semester to 255 during its fourth semester. At peak periods, 80 to 90 students attended an average of two hours a week.

The main support for attendance at the Center has come through referrals from faculty members. By the end of the first year, 55 faculty members had made referrals to the Center; by the end of the second year, 80 out of 160 faculty members had referred students. From time to time, bulletins are placed in faculty mailboxes with attached referral slips. The Center is also publicized in the student newspaper and through printed brochures.

EVALUATION

Since there are many variables connected with grades, it is difficult to measure the relationship between hours students attended the Center and their grades in class. However, responses to questionnaires of students who attended the Center indicated, with very few exceptions, that they had benefited from participation. A number of students have made exceptional progress. Some of these students' experiences are listed below:

1. A woman student, who had had considerable experience in writing but no previous background in electronics or engineering, enrolled in a class in Technical Writing. Although her instructor warned her that she would be competing with many students who had had an engineering background, she was permitted to continue in the class and supplemented her classroom work by studying programmed lessons in electronics at the Study Skills Center. She received a final grade of "A" in Technical Writing, and an offer of employment in technical writing with an electronics firm.

2. A student, with no previous background in algebra, was failing her course in elementary algebra midway through the 1963 fall semester. She withdrew from the class, but continued studying programmed lessons in algebra for the remainder of the semester. She re-enrolled in beginning algebra in the 1964 spring semester, supplementing classwork at the Center. She received a "B" as final grade in the course.

3. Two sisters, immigrants from Germany, were getting "D's" and "F's" on compositions in English fundamentals. They were referred to the Center by their instructor and supplemented their classroom work for two months. They received final grades of "C." They did not attend the Center during the following semester while enrolled in English I, composition, but each received a grade of "B."

4. A middle-aged male student, away from school for many years, had difficulty with English fundamentals. He studied programmed lessons in grammar at the Center and raised his class grade from "D" to "A."

RECOMMENDATIONS

In evaluating the Study Skills Center activities over the past two years, the following recommendations are made:

1. To send a record of students' attendance and progress to instructors making referrals, and to request from these instructors evaluations of students' classroom work as a result of supplementary attendance at the Center
2. To make a study of characteristics of students who are successful through learning at the Center
3. To explore the possibility of using honor students to assist the counselors at the Center, either on a paid or voluntary basis
4. To increase the number of orientation sessions for faculty departments at the Center

WALTER HADEL

PROGRAMMED INSTRUCTION IN MATHEMATICS

Certain problems, some of them unique to the junior college, have arisen to plague administrators in recent years. Problems have resulted from the great increases in the numbers of junior college students, the sharply rising costs of education, and (in my particular field of interest) the introduction of the so-called "modern" mathematics.

To a great extent, programmed materials, used either in a teaching machine or in a textbook, appear to contribute to the solution of problems represented by the following situations and circumstances:

1. Weak or failing students who need extra help to strengthen ideas presented in the classroom;
2. Students who have been absent for a period of time and who must "make up" the work missed;
3. Students who need a review of an entire course or courses taken several years before, the knowledge of which is a prerequisite for the next course in sequence;
4. Students who need a quick review for the purpose of obtaining course credit by examination only;
5. The incapacitated student who cannot attend classes or whose physical disability creates a hardship in the classroom;
6. The large and increasing numbers of drop-outs;
7. The creation of better understanding of the "new" mathematics among teachers, especially at the elementary level, who may be attending in-service training programs, or by prospective teachers in preservice training programs, in those communities where the junior college plays a vital role in these activities; and
8. The need to bring about better understanding of the new mathematics among parents.

To illustrate the way that programmed instruction may contribute to the solution of these problems, I shall first describe briefly the production and use of programs in mathematics at Los Angeles Pierce College; second, report national trends in the publication and distribution of such programs; and finally, describe the use of these materials in California public junior colleges.

PROGRAMMED MATERIALS IN MATHEMATICS AT LOS ANGELES PIERCE COLLEGE

Progress in the production and use of programmed materials nationwide in all subject fields over the past few years has been hampered for several reasons. Among these reasons are the following:

1. The materials are very difficult to prepare;
2. Teachers have sometimes reacted negatively because they fear they will be replaced by machines;
3. To be on the market first with the most, publishers issued materials which were, in many cases, poorly prepared and difficult to administer; and
4. A conflict of interest exists between a fundamental aim of programmed instruction, namely to allow students to proceed at their own rate, and the collection of tax monies by junior colleges for time spent in the classroom, or for average daily attendance.

Let us review here the difficulty of preparing programmed materials. The road to the final output of a suitable program is long, extremely detailed, and virtually endless. This can be observed by reviewing the process followed at Los Angeles Pierce College, and generally by programmers nationwide, in developing texts in mathematics.

1. Objectives for each unit of a proposed text are first formulated and the content analyzed to determine its logical sequence;
2. Short sequences of frames are written and tested on one or two students in a setting where the programmer and the student can discuss problems arising in responding correctly to each frame;
3. These short sequences of frames are revised on the basis of this testing, and again tested on one or two students;
4. When each unit is completed following another revision, it is then tested in its entirety on from six to ten students. The effectiveness of the program at this stage is judged by the comparison of scores on pretests and posttests designed to determine the degree to which the program achieved its stated objectives;
5. Each unit is again revised on the basis of an analysis of the errors, and once more each is tested on from six to ten students;
6. When all units have passed through each of these five phases, copies are submitted to reviewers for their reactions. At the same time, the entire program is subjected to classroom testing conducted in a wide variety of situations and with a number of different kinds of students. All response sheets used in this classroom testing, as well as population descriptions, instructional procedures, and pretest and posttest data for each unit, are analyzed; and
7. On the basis of this information, each unit is again revised and the entire program is then submitted to the publisher.

In view of this exhaustive and exhausting procedure, it can be readily understood why programmed materials are not being produced with the same rapidity as standard textbooks.

At Pierce College, following the procedure outlined above, two faculty members of the mathematics department have created a five-volume, 4,500-frame program on beginning algebra,[1] which was subsequently published. The publisher of that program later released a 1,000-frame program on number systems, produced at Pierce and designed especially for the in-service training of elementary teachers.[2]

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[1] I. Drooyan and W. Wooton. *Programmed Beginning Algebra* (New York: John Wiley and Sons, 1963).

[2] I. Drooyan and W. Hadel. *A Programmed Introduction to Number Systems* (New York: John Wiley and Sons, 1964).

These publications, in addition to others in different subject areas, are available to students at Pierce College through a lending arrangement at a Student Skills Center, where the materials can be used for periods of two to three hours. Included in these is a programmed text on vectors written by a junior college instructor at San Bernardino Valley College.[3]

Instructors at Pierce College are urged to refer students to the Student Skills Center for any of several reasons:

1. To help weak or failing students to better understand ideas presented in the classroom;
2. To permit students to review contents of lectures missed or to prepare for examinations;
3. To make students more knowledgeable in the basic foundations of mathematics; and
4. To give the better student an opportunity to study materials for enrichment.

NATIONAL TRENDS IN THE PUBLISHING OF PROGRAMMED MATERIALS IN MATHEMATICS

Despite the difficulty of producing programmed materials, a significant number have been published in the field of mathematics. Descriptions of these are conveniently listed in a guide, "Programs, '63," published in September, 1963, by the Information Division of the Center for Programed Instruction in cooperation with the United States Department of Health, Education and Welfare.[4]

An earlier edition of the guide, published in 1962, listed 122 programs in nine subject areas.[5] In comparison, the 1963 guide lists 352 programs, a gain of approximately 189 per cent in one year. One hundred twenty-three, or 35 per cent of these, are in mathematics.

Thirty-three American and English companies reported programmed materials in mathematics. Of these, the Encyclopaedia Britannica Press was the most prolific with 18 such programs, followed by Teaching Materials Corporation with 11, McGraw-Hill Book Company with 10, and Doubleday and Company with seven. Eighteen of the companies, however, reported only one or two publications in mathematics.

With regard to mathematics content suitable for junior college use, 12 of the publications were complete one-semester algebra courses, while eight consisted of small segments of algebra courses, including, for example, verbal problems and simultaneous equations. Geometry, trigonometry, set theory, statistics and probability, and an introductory calculus were also available in a programmed format.

Eleven were applications of mathematics to other fields with titles such as

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[3] R. Carman. *A Programmed Introduction to Vectors* (New York: John Wiley and Sons, 1963).

[4] L. F. Hanson and others. *Programs, '63, A Guide to Programmed Instructional Materials Avialable to Educators by September, 1963.* (Washington, D.C.: U. S. Office of Education Bulletin No. 3, 1963, OE-34015-63).

[5] L. F. Hanson and others. *Programs, '62, A Guide to Programmed Instructional Materials Available to Educators by September, 1962* (Washington, D.C.: U. S. Office of Education Bulletin, OE-34015, 1963).

"Mathematical Bases for Management Decision Making,"[6] "Arithmetic for Nurses,"[7] "Arithmetic of Computors,"[8] "Basic Symbolic Logic,"[9] and a game of logic called "WFF 'N Proof."[10]

In 1964, I requested up-to-date lists of programmed materials in mathematics from the 33 American companies which reported programs in the guide. Twenty-five companies replied.

From a review of the responses, it would appear that the pace of publication in mathematics is slackening. The scope of the material, however, is widening and it is hoped that the quality of the output is improving.

Following are three examples of current activities. The 1964 educational catalog of the Encyclopaedia Britannica Press shows the addition of four programmed texts in mathematics beyond those listed in 1963, two dealing with the modern mathematics and two with basic foundations in algebra and geometry.

John Wiley and Sons' Director of Programmed Instruction reports an increase from two programs in mathematics last year to nine at present.

Another type of activity which serves to introduce programmed text materials to the reading public is the work of the General Programmed Teaching Corporation of Palo Alto, California, which has produced and supplied programmed texts to four different publishers.[11] Twenty-six of its products in several subject fields are available or are soon to be released by these publishers. Of these, eight are now in mathematics as compared to four in mathematics in 1963.

However, the picture is not one of unanimity in the matter of increases. Twelve of the 25 companies replying have added no more publications in mathematics to those listed in 1963. A comment from a mathematics editor at one company points up a valuable by-product gained from experiences in the publication of programmed materials:

> It might be noted, however, that the techniques of programming have been very influential in the developing of some sections of our regular textbooks. This influence has extended to the size space used in presenting materials and to the occasional provision of easily accessible answers to exercises. I think that this will become more evident in books that will be appearing in 1964 and 1965.

I have dealt only with those publishers shown in "Programs, '63." Advertisements, displays at conventions, and announcements from publishers indicate that others have produced materials. It seems safe to assume that a great deal of experimental programming is taking place throughout the nation. Much of this undoubtedly will not receive national distribution.

TRENDS IN CALIFORNIA JUNIOR COLLEGES

To obtain a picture of the current situation in California public junior colleges, the chairmen of the mathematics departments of the 74 public junior colleges in the state were questioned by mail. Seventy-three of the colleges replied, a 98.6 per cent return. Through this inquiry, I sought to:

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[6] A. Holzman, R. Glaser, and H. Schaefer. *Mathematical Bases for Management Decision Making* (Chicago: Encyclopaedia Britannica Press, 1962).

[7] M. Ferster. *Arithmetic for Nurses* (New York: Springer Publishing Company, 1961).

[8] N. Crowder, *Arithmetic of Computors* (New York: Doubleday and Company, 1958).

[9] J. Becker. *Basic Symbolic Logic* (Camden, N.J.: RCA Educational Services, 1961).

[10] L. Allen. *WFF N' PROOF* (Chicago: Science Research Associates, 1962).

[11] The four publishers are the Encyclopaedia Britannica Press, Harper and Row, Ginn and Company, and Scott Foresman and Company.

1. Determine the extent of present or proposed usage of programmed materials in mathematics;
2. Determine the specific materials used, including the authors or publishers;
3. Determine how the materials were used;
4. Ascertain whether or not faculty members were actively engaged in writing programmed materials, and if so, to obtain a description of them;
5. Learn if students were using such materials to prepare for course credit by examination only;
6. Solicit comments on advantages or disadvantages in the use of programmed materials in mathematics; and
7. Solicit suggestions and recommendations regarding these materials.

Following is a review of the findings.

Extent of Usage. Twenty-seven colleges, or 38 per cent, are using programmed materials in mathematics. Forty-five respondents, or 61 per cent, indicated that they plan to use or will continue to use such materials. Four were undecided. Of the 27 now using such materials, only two plan to discontinue such practice.

Types of Materials Used. Junior colleges now employing programmed materials are using them in a wide range of subjects, extending from the language of sets and basic mathematics through an introduction to statistics. Eight publishing companies were represented.

With regard to future plans for programmed materials in mathematics, ten colleges indicated that no changes would be made. Ten others are "shopping" to determine the best materials for their purposes. The remaining colleges that plan to use such materials have chosen new publications principally from the Encyclopaedia Britannica Press, Wiley and Sons, and Doubleday and Company.

Both Foothill and Ventura College faculties look forward to using programmed texts written by their own staff. Los Angeles Trade-Technical College has purchased 15 teaching machines, and is seeking materials for use with the machines. The national School Mathematics Study Group (S.M.S.G.), was named by the Napa College respondent, whose departmental plans include the use of that group's programmed "First Course in Algebra."

How the Materials Are Used. Twenty-six respondents reported that programmed materials were being used as basic textbooks for courses, and 15 for use as supplementary material. Others stated that the materials are used: (1) for a review of units in a course; (2) as a review for a mathematics placement examination for entrance to the first course in calculus; (3) as refresher and enrichment material; (4) as a basic workbook for a course; and (5) in computer programming.

Faculty Writing of Programmed Materials. Replies to the inquiry reveal that faculty members in only a few California junior colleges are writing programmed materials for publication. Sixty-eight reported that no writing was being done. Of the five who answered in the affirmative, the work at Pierce College appears to be the most extensive. Two instructors at Foothill College are preparing a programmed text on the structure of arithmetic, and an instructor at Ventura College is programming material in arithmetic.

Cerritos and Chaffey Colleges pointed out that efforts to produce programs were being made for local consumption only. The Cerritos respondent explained:

> We do plan to purchase a new machine next year and plan to write a few programs for it for our own use and again just to supplement class assignments.

The head of the mathematics department at Chaffey wrote that programmed writing was going on, but "only in very small units used locally on an experimental basis."

Course Credit by Examination Only. Another purpose for which programmed materials may be used to good advantage is suggested by the practice in some colleges of granting credit for courses by examination only. A student, planning to obtain course credit by this means, could prepare himself through the use of programmed materials. The returns showed that 57 colleges do not grant credit for any mathematics courses by examination only, 13 do give credit, and the remaining three were on the borderline, using such phrases as "rarely," "only seldom," and "not generally, but we might make exceptions."

Responses from 12 of the 13 colleges which do give credit by examination indicated that programmed materials are not used by students in preparation for examination. It should be noted here, however, that of these 13, nine do not use programmed materials. Hence, of the four which use programs, only one had students using such materials to prepare for examinations for course credit.

Advantages and Disadvantages. Comments were sought regarding advantages or disadvantages in the use of programmed materials in mathematics. Advantages reported, not necessarily in the order of their frequency, include the following:

1. Programmed materials are useful for both the very good student for acceleration purposes and for the poor student for review purposes;
2. Remedial instruction can be handled solely by programmed materials, saving instructor time;
3. The student learns at his own rate, in small steps, with active participation and an immediate knowledge of results; and
4. Skills are improved, learning increases, time is saved, students are motivated to a greater degree, with a correspondingly greater number of successful students.

The following disadvantages were indicated:

1. The material is too elementary and too simple; it is incomplete, and leaves out difficult concepts and problems;
2. No major difference exists in the mastery of material between programmed and conventional groups;
3. Cost of the materials is prohibitive; and
4. Slow students have difficulty in reading and comprehending the material, boredom increases, and motivation decreases with continual exposure. Many students cannot accept the freedom they are provided in a programmed course.

Suggestion and Recommendations. Several suggestions and recommendations were made. One instructor stated:

We have a traditional course for each programmed course given at the same time and allow students to change from one type of teaching to another after two weeks but not later than four weeks of instruction. This takes care of most of the disadvantages except for the greatest one—"it is too easy to put off."

Another expressed concern about costs and suggested that a report on how other junior colleges are handling this problem would be helpful; that is, through bookstore lease, student purchase, laboratory fees, library loan, or other means.

Others recommended that programmed materials not be used beyond intermediate algebra, that they be used only for shut-ins who cannot attend classes, and that they include additional work problems for which only the instructor has the key or the answers are in the back of the book.

Finally, one respondent asserted that there was a need for "good authors of programmed texts."

EXPERIMENTATION AT SAN DIEGO CITY COLLEGE

In the 73 responses, one could discern an almost universal desire to know more about the worth of programmed instruction. A few colleges are doing some experimentation. Notable among these is San Diego City College, which in cooperation with the State Department of Education, Bureau of Industrial Education, conducted an experiment in the 1961–62 school year in the area of technical mathematics. The college sought to determine the relative efficiency of programmed self-instructional material, compared with the traditional methodology and text material. The course of study was broken down into very specific objectives. Programmed material and teaching machines selected were based on these objectives. The experiment was designed, and measuring devices constructed, prior to the selection of the material.

Eleven classes were involved in the experiment, some as control groups, others as experimental groups. Ten tests were administered, a pretest to measure initial comprehension, eight criteria tests to measure subject area understanding, and a final posttest to measure subject mastery.

The most important results of the experiment were:

1. The classes using programmed material were consistently higher on test scores;
2. The machine-taught class met the objectives of the course in 44 hours as compared to 97 hours for the traditionally taught class;
3. The machine-taught class made a significant gain in growth over the traditionally taught class; and
4. Students' reactions to programmed learning were favorable and their interest remained high throughout the semester.

In the 1962 spring semester the experiment showed similar results and indicated that the machine-taught group met the course objectives in 42 per cent of the time normally required.

The experimenter concluded that programmed teaching:

1. Presents information to the student equally as well as the traditional classroom methods;
2. Requires responses which are measurable;
3. Aids in individualizing instruction and in conserving instructional time;

4. Substantiates earlier studies that point up the fact that errors in the exact sciences are directly related to reading comprehension;
5. Is accepted by the student as a means of learning fundamental concepts;
6. Allows students to progress at their own ability rate; and
7. Provides students an opportunity to meet the particular course objectives with a considerable saving of time.

Two years later, a similar experiment was performed using a programmed text in basic mathematics. Conclusions included these two findings, not previously mentioned:

1. The programmed-text group had a drop-out rate of 9.6 per cent as compared to 21.3 per cent for the control group; and
2. The unit cost per student in the programmed-text group was 35 per cent lower than in the control group.

CONCLUSION

Results of the investigations, made in the preparation of this presentation, suggest that for certain well-defined purposes, and for the possible solution of some real problems at the junior college level, programmed instruction in mathematics, as well as in other disciplines, is worthy of your consideration and use.

SECTION IV

Television in Instruction

CLIFFORD G. ERICKSON

IMPROVING INSTRUCTION THROUGH THE USE OF OPEN CIRCUIT TELEVISION AT CHICAGO CITY JUNIOR COLLEGE

Some ten years ago we asked ourselves if instruction could really be carried on by television. Today, I am here at the invitation of the conference planners to speak to you about improving a college's entire instructional program through the use of television. In this paper I shall indicate just a few of the ways in which our TV College operation in the Chicago City Junior College has opened up new instructional directions and, indeed, has brought about the improvement of instruction in general.

In 1956 Chicago City Junior College was awarded a three-year Ford Fund grant of $500,000 to explore the area of direct instruction by television. This grant made possible the development of TV College.

THE SCOPE OF TV COLLEGE ACTIVITIES

TV College is an integral part of the Chicago City Junior College, offering Chicago-area viewers about 25 hours of open-circuit programming each week during the fall and winter trimesters—double the air time of the first year of telecasts (1956–57). At present, eight or nine courses are offered in each of these terms in day and evening series. Four courses are usually live presentations while the others are videotaped replays. Six courses are offered via tape in the summer trimester. All broadcasting is done on WTTW, Chicago's VHF Educational Channel 11, as stipulated by the terms of a contract between the controlling boards of the college and the station.

During the fall and winter trimesters, credit registrations average 3,000. Students are not enrolled in TV College as such, but in the Chicago City Junior College or Chicago Teachers College. Another three to five thousand enroll, but not for credit, by mail. Surveys conducted by the station indicate that a given course may be viewed by as many as 250,000 people in a single term.

All the courses are carefully prepared well in advance of presentation. Teachers are usually employed during a summer preceding the term of presentation for preparation. The teacher begins preparing by defining his objectives, and ends by drawing up drafts of examinations. The entire plan is finally incorporated in a published study guide which assists the self-directed television learner. During the period of actual presentation, teachers are released from all other duties. All in all, a television course represents a substantial investment in teacher time and salary.

Although we still bring college-credit courses to at-home viewers whose goal is the Associate in Arts degree, we have also concentrated on the achievement of other objectives. We are, for example, using TV in pre-service and in-service teacher training in cooperation with Chicago Teachers College. The use of TV for direct instruction in our classrooms has been expanded, and we are looking for many ways to make this kind of instruction still more effective. We are also employing TV courses to enrich the educational experience of gifted high school students. We are searching for new ways to use instructional television with special students—that is, with students confined to institutions or to their homes.

Certain courses, the objectives of which include the achievement of skills, require that students mail in frequent written assignments. These papers are graded and returned by the TV teacher and experienced faculty members—called section graders—paid at their regular rate to assist him. Teachers of such courses also employ other "feed back" materials—programmed exercises, self-scoring exercises of various kinds, projects and reports.

In fact, in recent terms teachers of all television courses have begun to insert programmed materials and objective self-scoring exercises in their study guides. Many are now using special answer sheets, such as the color tutor, which are available through commercial channels.

THE ACHIEVEMENT OF STUDENTS

Mounting evidence indicates that TV students can learn as much as students in regular classroom situations. Our experiences over eight years indicate that mature, highly motivated home viewers often learn more in a given course than do their college-age counterparts attending classes on campus.

From the beginning the TV college staff has conducted intensive research, based on careful experimental controls and carried out in phases. During the first phase our investigation centered on the feasibility of offering full-credit college courses to at-home viewers. This phase revolved about intensive comparisons of the performance of at-home viewers with that of full-time day students on campus, with the achievement of the latter taken as the base, but when it became apparent that the at-home viewer, older and better motivated, consistently out-performed the student of college age, we began the second phase of investigation, taking as our base the performance of the more mature student taking on-campus courses in the evening.

When the data began to show clearly that the at-home viewer did as well as, or better than, his on-campus equal in age, we opened a third investigative phase in which we set out to compare the performance of at-home students with that of TV-in-class students—the latter students of normal college age watching television courses in Chicago City Junior College classrooms. The at-home viewer tended to do, on an average, a half-letter grade better than the TV-in-class student. We took it as a premise that henceforth the at-home viewer should be regarded as the base of all achievement comparisons, with his performance the standard. It became apparent that the instructional factors playing a part in the high performance of at-home students held implications for the improvement of classroom instruction. The immediate problem, however, was the performance of teen-age students watching TV in class: should we deliberately lower at-home "TV standards" to meet the needs of on-campus use, or should we strive to preserve these standards and encourage on-campus students to rise to meet them? Needless to say, we chose the latter, for purposes of, first, improving the uses of TV in the classrooms—the immediate problem, and, second, looking for ways to apply instructional techniques developed by open-circuit teachers to instruction throughout the college.

The instructional quality of TV College courses is not to be wondered at when the conditions of open-circuit teaching are kept in mind. Instructors are given special assignment for preparation and release from all other duties for actual presentation. Since they are on open circuit in an area that boasts of several universities of international repute and many colleges, teachers feel the "pressure" of being observed by experts in their fields. Certainly there is every reason to believe that open-circuit broadcasts aimed at mature students under these conditions encourages a degree of scholarly and instructional care not associated with intramural closed circuit operation on a junior college level.

IMPROVEMENT OF PERFORMANCE OF IN-CLASS GROUP

As just indicated, investigation of the performance of TV-in-class groups and TV-at-home viewers disclosed a disturbing difference in the level of achievement, with the former group consistently at a disadvantage. Not only was the achievement of the TV-in-class group lower, but also their interest in TV courses tended to lag significantly as the coure went on. The rate of student withdrawal from TV-in-class courses and the nature of responses given on interest questionnaires before and after a course showed that interest waned markedly as the televised lessons progressed.

From 1959 until 1961 we tried several ways to give in-class viewers additional help to enable them to bridge the gap between their performance and that of TV-at-home students. Before 1960, when our format was three half-hour telecasts per week, we tried adding to each telecast a 20-minute classroom discussion led by a classroom instructor. Since this short discussion period proved unproductive, we added a weekly 50-minute discussion to the three telecasts. This 50-minute period was much more satisfactory. But the addition of it to the three telecasts made it extremely difficult to fit TV courses into an on-campus student's total class schedule. Therefore, we abandoned the three 30-minute telecasts in favor of the 45-minute sessions. We concluded, in short, that for the TV-in-class student of college age and average ability at least one extra hour's class instruction is needed to supplement the twice-a-week 45-minute telecasts. We also learned that, to be productive, this classroom instruction must be conducted by an experienced classroom instructor who follows the televised lessons along with the class, using the texts and study materials prescribed by the TV instructor. In effect, the in-class instructor is a working member of a team led by the TV instructor. He cannot be someont whose attitude toward the television instruction is supercilious or indifferent.

Once the TV-in-class students started to receive this extra instruction, their performance began to approximate that of the at-home viewer and conventional on-campus students. Prior to 1959 the performance of TV-in-class groups was consistently lower. The achievement of "concurrent" TV students (students taking a TV course or two at home along with their conventional on-campus courses) was, on an average, a half-grade below that of their regular courses. By the end of 1961, the performance of TV-in-class students had equaled that of classroom students. By fall 1962, a TV-in-class group had achieved more than a conventional classroom group.

There is some evidence that the promise indicated by this sample comparison is not without foundation. Recent comparative studies show that TV-in-class students receiving the additional instruction tend to do a half-grade better in their TV courses than in their regular on-campus classes. At present, there is, on an average, a full-grade difference between the performance of TV-in-class students receiving follow-up instruction and TV concurrent students without follow-up sessions. The follow-up instruction conducted by an experienced instructor has also improved significantly the retention rate of TV-in-class students, especially as opposed to on-campus students watching TV without the benefit of follow-up discussion.

VALUE OF TV IN THE CLASSROOM

Uses of TV-in-class bring a number of advantages to the Chicago City Junior College campuses. First of all, the TV College course permits the skillful teacher to reach many more students than he could under usual circumstances. Second, TV-in-class enables the less-developed campuses of the Chicago City Junior College to schedule offerings in areas in which they lack faculty. Third, TV-in-class is an improvement in many respects over the large lecture section that is a fixture on many campuses. Every student "sees" the demonstration or the exhibit, since every student has a front seat. Fourth, TV-in-class is an effective way of relieving the overflow of students. Without it many of our students could not take certain courses, or would be forced to delay taking them. Finally, TV provided superior instructional materials for on-campus use.

VALUE OF TV IN THE OVERALL PROGRAM

One of the goals to which we hope TV programs and related research are leading is the college-wide achievement of high quality instruction. This goal can be achieved only if we keep a representative part of the college faculty actively and enthusiastically involved in instructional television. This we have managed to do so far, with the result that the TV College program has become a "catalyst" in the Chicago City Junior College instructional program. Ideas, new precedures, and innovations, once they have been introduced and assessed in the TV College program, "spill over" into the conventional instructional program. For example, the television instructor, who learns that programmed self-scoring materials are useful in helping at-home students use his physical science study guide to master the concept of "time" will introduce this instructional innovation when he returns to his department—especially since he knows from years of experience that the usual textbook explanations befuddle most students. But the most exciting dimension of our research design really resides in the sense of common purpose it has given some of our teachers. We have generated a sense of genuine professional excitement in some academic departments by releasing a teacher from all his normal duties, "turning him loose" to present a single course on TV, and encouraging him to initiate or participate in research as to the effectiveness of his course and instructional materials.

The fact that the full resources of the college's instructional evaluation staff supports the television teacher as he devises projects, examinations, programmed materials, and self-scoring devices has tended to improve overall instruction. Examinations and curricular materials developed by TV teachers come to on-campus departments only after they have been refined by statistical analysis and actual use.

Finally, a look at the academic qualifications and experience of the teachers who teach these open-circuit courses and prepare the study guides and study materials will suggest further reasons for the "spill-over" into the general instructional program we have been discussing. One-half of the instructors who have taught on TV hold the Ph.D. degree. They average slightly more than ten years of college teaching experience. Only a small percentage of those who apply are actually selected for television teaching, and those applying come from the total junior college and teacher college faculties. It is a rare junior college that could assemble this kind of faculty.

COST OF QUALITY TELEVISED INSTRUCTION

In 1956 our televised instructional costs surpassed classroom costs. But their relationship has now been reversed. The unit cost of television instruction has been reduced by careful scheduling of courses to increase enrollments, by multiple use, by videotape recording, and by adjustment of nonessential factors in the instructional situation without sacrificing the quality of the materials and learning situation. Thus we are able to offer an improved instructional product without an increase in costs.

MILDRED BULPITT

INSTRUCTION VIA TELEVISION AT PHOENIX COLLEGE

For 43 years Phoenix College served a community bounded largely by the Union High School District for the City of Phoenix, Arizona. During 1963–64 this community was expanded to include all of Maricopa County, an area of 9226 square miles with a population of approximately 800,000.

SERVING THE COMMUNITY

In general, Phoenix College is now concerned with the best possible junior college instruction for its greatly expanded community. In practice, Phoenix College expanded its community a year earlier than its entrance into the new county junior college system when it began a new program of statewide television offerings over local commercial television channels. In 1961, KPHO, Channel 5, in Phoenix, made one-half hour a day available for use by the college for public service purposes. In the fall of 1962 three additional half-hour slots were made available by KTVK, Channel 3. During the school years 1962–63 and 1963–64, Channel 5 donated one hour each day, and Channel 3 continued its offering of three half-hour periods.

Through contribution of time by these two local channels—one independent and one network—it has been possible for Phoenix College to offer 35 different courses, taught by 23 different instructors.

Although Arizona has experienced a phenomenal growth in population in recent years, it is still a large, sparsely settled state with two predominant population centers. A population of one and one-half million is spread over 113,909 square miles.

A new Arizona junior college law makes it possible for junior colleges to serve six or eight of the 14 counties in the next ten years. But new colleges will not be established to serve small, intimate communities. Instead, they will serve large county or two-county districts. Through its TV program, Phoenix College has extended the junior college to most of Arizona and small parts of California, Utah, and New Mexico. (Our first television graduate, for instance, who graduated with distinction this last June, lived 120 miles from Phoenix and approximately 20 miles from the nearest paved roads, in Wagoner, Arizona.)

Public service television time is seldom likely to be offered to any school at peak viewing hours, and the time periods given to Phoenix College are no exception. However, we have found that we do attract a fairly wide audience to the morning session (10:45–11:15 a.m. and 11:30 a.m.–noon) on one channel, and to the three half-hour weekend spots on the other.

Use of morning time has also made it possible to assist other agencies with certain educational needs. For example, a first aid program was offered in cooperation with the local fire department. Firemen who needed to renew certificates took the course and assisted in it by supervising practical examinations at local fire stations.

This brief survey is enough to show that we are enabled to serve a huge area. We have had reports from the studios to indicate that they estimate a viewing audience of several thousand for some of our courses. Our enrollments, though ranging all the way from four in one course to 230 in another, also illustrate our wide service area. Students from Silver City, New Mexico; Blythe, California; Cedar City, Utah, and from throughout Arizona have taken courses for credit.

IMPROVING INSTRUCTION

We know that our instruction is reaching a great number of people. But how have we improved instruction through the use of commercial television?

It must be admitted that we did not begin our telecourses with this purpose uppermost in our minds. The most exciting prospect originally was to take what we had—we thought it was good—and extend it across the entire state. The instructors themselves weren't very enthusiastic. When we began in 1961 we had some trouble convincing two of our finest instructors to try the new medium. The complaints most frequently heard from them were that there would not be enough time to do the job as they did it in longer periods on campus, and that they feared they would be aiding and abetting in the prostitution of college credits.

The experience of most of our 23 instructors has not reinforced their preconceived prejudices against television teaching. On the contrary, from interviews with them and from their own written evaluations of their experiences, we can list the following points that seem to have contributed to the improvement of instruction.

1. Television teaching made the instructors more aware than ever before of the value of using visual aids in instruction. The necessity to provide some visual stimulation and to avoid boredom for a television audience prompted them either to break with the lecture method completely or to modify it into an illustrated lecture using related material.
2. Teachers became more aware of the necessity to vary visual techniques already used in courses usually thought of as demonstration lectures. Applied music demonstration courses in which techniques are illustrated by the instructor were expanded through use of such an aid as an electronic keyboard.
3. Through the experience of seeing themselves "as others saw them" on test tapes and on monitors, the teachers became aware of speech mannerisms and other idiosyncracies. They became more concerned with proper dress and appearance.
4. Many of the teachers learned much about interviewing techniques, and felt that they could apply these effectively in exchanges with students in a class situation. This experience derived from their attempts to vary format by having guests appear with them and by experiencing—on television—the deadly silence that can result from poorly devised questions.
5. The pressures of what seemed to be the most intensive type of exposure

which they had ever felt made them revise well known materials and make every attempt to present them clearly and concisely. They found when they did this that the 30-minute television period actually could encompass more material than they had usually covered in a 50-minute period, a fact that seemed both startling and gratifying to those who verbalized it.

6. Their initial feelings that they would miss the physical presence of students—the opportunity to react to them—soon faded. This happened as they recognized that, rather than speaking to a mass audience they were actually speaking to one or two persons in the intimacy of their living room. Usually, the first fan mail or phone calls from individual viewers started this change in attitude, and it grew as instructors realized the effectiveness of a presentation that was geared to a one-to-one ratio. These were not lectures aimed at a faceless mass audience, they learned, but extremely intimate one-way conversations with friends who chose to invite them in.

Most of the instructors involved, approximately one-seventh of the faculty, learned they had improved their instructional techniques as a result of television teaching. The administration learned from some of the improvements in the teaching of instructors it already regarded as among its best that some techniques well known to commercial television could be applied to the in-service training of all teachers. Last, but not least, the commercial television studios learned, from the wide and enthusiastic response to the educational programs, that ETV doesn't have to be as dull as they had feared it might be when they handed it over to educators.

J. W. McDANIEL

INSTRUCTION VIA THE COLLEGE-OWNED TELEVISION STATION AT SAN BERNARDINO VALLEY COLLEGE

It is important to recognize that television at San Bernardino Valley College has from the outset been a combination of a technical training program and an agency for improving and extending instruction. The college owns and operates its own television station, with facilities used for technical training as well as for broadcasting.

The division of telecommunications, headed by a chairman who also doubles as station manager, employs an engineer, two engineering technicians, two director-producers, a continuity writer and traffic controller, a part-time staff artist, and a division secretary. Most of these people are also employed as teachers, and have the dual role of carrying out their television functions, and teaching students to perform these same functions.

The facilities and equipment of the television station include:

1. Two studios with adequate lighting and air conditioning
2. Control rooms, recording and transmitting rooms, work rooms, and offices
3. Two image-orthicon cameras
4. Two vidicon cameras
5. One microscope camera
6. A film chain, and slide-control equipment
7. A large videotape recorder
8. A videotape playback unit
9. A transmitter and control equipment.

The college also owns enough television receivers to equip as viewing rooms an auditorium, a large lecture room, and several smaller classrooms. We are now in the process of acquiring and installing remote pickup equipment, including a portable videotape recorder and microwave apparatus.

All equipment is of standard broadcast quality. In the main, the station installation was designed by the electronics department of the college, and much of the construction and installation work was performed by students in the electronics division.

TRAINING PROGRAM

The telecommunications division trains students for employment in both the engineering and the production aspects of radio and television. Two-year curricula in each of these areas provides a highly specialized training program based on such general education as is required for the Associate in Arts degree. Students who wish to prepare for various positions in radio and television engineering complete one year of basic electronics and then devote a second year to specialization in the operation, installation, and maintenance of studio, recording, and transmitter equipment. "Engineering" trainees learn operation of the television equipment as well as maintenance. This makes the program more attractive and prepares the students for the multiple responsibilities of small television stations.

The training program for production workers includes theory courses in the engineering and in the communication aspects of broadcasting. Each course includes a laboratory segment and gives students actual experience. Students are organized into working teams and assist in the production of all live programs originated by the college. Qualified students are given the experience of planning, writing, producing, and directing television programs.

"OPEN-END" COURSES

Courses are of the "open end" variety. Students may transfer all credit to one of several colleges that offer baccalaureate work in communications. But the principal intent of the courses is to prepare people for employment. The college permits and encourages students whose interest in television is avocational to take such courses for which they are qualified and to participate in the television production programs. Enrollments in television have not been as high as expected. We operate both day and evening classes, and it has required a coordinated use of the students enrolled in all sections in order to supply the student manpower that is the backbone of our television operation. It is our judgment now that the needs of the television industry will support a few healthy programs like ours, but not very many in any one locality.

Programs have been developed for instruction in college, secondary, and elementary schools. In addition, the station has broadcast programs obtained from local and national sources.

The station has completed its second year of broadcasting, increasing operations from 12 to 30 hours weekly during that period. We have used a combination of closed circuit and open circuit operations.

We have rebroadcast during daytime hours the nationally televised "American Economy" course, as well as several college-produced courses. During the first semester of operation a college biology teacher developed and taught a standard general biology course to approximately 400 campus students and a smaller number of off-campus students. This course involved the production of approximately 50 45-minute lectures. Since that time we have limited the length of a television lecture to 30 minutes.

The biology course has been rebroadcast during each succeeding semester, and has been the only scheduled class in general biology for both day and evening students. It has been necessary to broadcast the course at several different hours during each week. While we did not consider it desirable for us to duplicate in San Bernardino the numerous studies of the effectiveness of teaching biology by television, we have, of course, kept records on the course. The instructor reported at the end of the first semester:

> At this point in the presentation of this course it is the instructor's judgment that teaching biology in a single large group with the use of television is entirely feasible,

and that the extent of student learning may be expected to be normal. From the viewpoint of instructional method the greatest advantages of television appear to be:

1. The excellence of the visual presentation of demonstrations involving magnification;
2. The enforced necessity for precise course planning and the pacing of lecture presentation;
3. The equivalency of presentation to all day and evening students is assured by this method;
4. The accumulation of the lectures for the entire course on video tapes that makes them available for re-use, and that frees the lecturer from repetition of the same work; and
5. The stimulation and constant pressure toward perfection of a new and exciting method of teaching.

Other courses taught by television include:

History 4A–4B, Western Civilization—a standard two-semester humanities course.

History 10, American Foreign Policy—a newly developed single semester non-sequence course offered primarily for the general student and adult home viewers.

Economics 10, American Economy—a single semester non-sequence introduction to economics taught primarily for general students and adults who do not plan further specialized study in economics.

Business 108, Federal Income Tax Return Preparation—an eight-week course designed to help taxpayers prepare their reports.

Typewriting 23A, Beginning Typewriting—an eight-week short course for home viewers.

During 1964–65 we will repeat each of the above courses and introduce two new programs. The latter will require the development of television instruction for high enrollment courses that are ordinarily offered in many separate sections. Political Science 1 is to be a three-semester course largely devoted to American government; taught on campus by closed circuit to approximately 600 day students and 150 evening students. In addition to this, the course will be available as a credit course for home viewers.

Introduction to English Composition will be the lecture portion of a remedial English course to be released on both closed circuit and open circuit television to day campus students, evening campus students, and home viewers. This course will include all of the instruction necessary to integrate a four-hour weekly writing laboratory, and a two-hour weekly reading period. These three segments—lectures, writing laboratory, and reading—constitute an experimental program in the improvement of the teaching of "Remedial English." During the first semester, only 300 students will be enrolled in this experimental program. It is expected that at least 700 others will be taught an equivalent course by conventional procedures. Our hope is that the experimental program will prove to be more effective than the conventional procedures.

Instructional courses for elementary and high schools are broadcast to a potential viewing audience of 132,000 pupils. Control of an organized program, with offerings in several different subject fields, is vested in a formal committee chaired by the county superintendent of schools and made up of a member from each elementary and high school district in the county. Although instructional costs are borne by the school districts, most of the funds have been reimbursed by the state. This has been identified as a special pilot program. Only a few instructional television programs for elementary schools have been produced as live programs in our studio. These have been courses taught by teachers or supervisors from the elementary schools. Additional offerings have been secured on tape or film from other sources.

INSTRUCTION FOR SCHOOLS

The college has viewed its participation in instructional television for schools as a mutually beneficial program. The San Bernardino area has at present no nearby commercial television station. The availability of television for instruction is, therefore, dependent upon the schools' own efforts. We have tried to devise a fee structure for the broadcasting of courses that approximately meets production and broadcast costs.

Educational television programs of a noninstructional nature have been limited to a few productions developed by the station. Probably the most interesting was "Twentieth Century Dialogue," consisting of an hour of sophisticated conversation about a topic of interest to modern literate adults. Participants have included college teachers and other local professional people. The program has been well received.

Programs obtained from other sources for broadcast to local viewers have been mostly those made available to us through membership in the National Educational Television Network. These have included programs chosen to supplement course work in various subject matter areas.

The television medium can be used with as much vigor by school and college people as it is used in industry, commerce, and public service. We think that both instructional and cultural television have a place in junior college education. We are trying to demonstrate that a community college can utilize a television station as a vocational training medium as well as an educational distribution system. We are trying to demonstrate that teachers and students working together and learning together can produce and distribute high quality television programs. So far, we have no evidence that total instructional costs can be reduced by television. We are accumulating evidence that the quality of instruction can be improved, and that the services of strong teachers can be extended to more students. We have made a modest beginning. We hope to be able to continue this activity to the point where educational television becomes a well accepted service of a community college.

PHILIP C. GARLINGTON

EDUCATIONAL TELEVISION AT COLLEGE OF SAN MATEO—A PROJECTION

At the College of San Mateo, we've recently completed our first school year on the new $15 million College Heights campus.

We wanted College Heights to be attractive. But we didn't fully realize the effect that it would have on the young people in our county.

Here's what has happened:

In our first year, the enrollment exceeded our initial statistical projections by 33 per cent.

By this fall, as we start our second year, the enrollment will go up roughly another 30 per cent. That will bring it to a total of approximately 7,200 students, 700 more than the original capacity for which the campus was designed.

Already, with the paint hardly dry on the walls, we're bursting at the seams.

What are we going to do about this situation? For one thing, we're going to move ahead with our master building plan as fast as we can. For another, we're going to put television to work... full time.

EXPANSION AT SAN MATEO

Recognizing the need for expansion for continuing quality education, the people of San Mateo County recently approved a bond issue of nearly 13 million dollars to purchase land, to erect building and facilities on three new sites—two of them immediately—and to expand the College Heights campus. By 1967, College of San Mateo will have three separate campuses with an expected student body of approximately 8,800 in its day college alone. The college will see a growth of 1,000 new students per year. Evening college enrollment—now approximately 11,000—may double that figure.

Will these facilities be enough? And for how long?

With its "open door" policies, the college cannot refuse *any* qualified applicant. We cannot restrict our enrollment to what we can "comfortably" handle. The American junior college system proclaims the concepts that it is (1) the people's college, (2) tuition-free, (3) a comprehensive institution, (4) locally supported and controlled, (5) community oriented, and (6) emphasized by the master-teacher concept.

These concepts are not new or unique to American education, but they emerge unique to the junior college as soon as we accept the precept that education is, among other things, one of the most important tools for the preservation of the ideas and ideals which we like to think of as distinctively American.

In practice, however, we must be constantly aware that our ideas and ideals will be on trial as never before in the years ahead. The traditional methods of education are likely to become increasingly inadequate as we attempt to meet the stresses of larger and larger enrollment *without compromising our instructional standards* or sacrificing the ideals and ideas upon which the American junior college is based.

At College of San Mateo, we hold to these dedications. And because our goal is to maintain quality teaching in every classroom, we believe that we cannot overlook the means—any means—that gives promise of sustaining or improving the quality of our instruction.

PROMISE OF TELEVISION

One of the most promising of those means, we're convinced, is television. We're ready to go on the air this fall. When we do, our KCSM-TV will be the second college-operated television station in California. The first station is at San Bernardino Valley Junior College. We are turning to television as a means of continuing quality teaching by extending the range of quality teachers. With television, our best teachers will no longer be confined to the square footage of a classroom, but can reach out to students throughout the school and broadcasting area of their stations. By exchanging programming with other institutions, those same master teachers can be heard and seen by students across the country.

Ten years ago there were just eight educational television stations on the air. Today, 82 stations are carrying full program schedules, and over 250 universities, colleges, and high schools operate closed-circuit installations as a direct supplement to classroom teaching.

Dr. John Bartlett of Syracuse University put it this way: "Commercial television has proved it can sell products. Educators can use television to sell ideas. Commercial television has proved it can motivate people to buy; educators must use television to motivate people to think..."

Success story after story continues to pile up evidence to show the dramatic potential of instruction with our new medium—television. But what does this imply for College of San Mateo? Where do we go from here?

The board of trustees, in January of 1958, authorized the college to develop the potential of televised coursework... not only for regularly enrolled students of the college, but courses designed for the entire community. Our first two courses, now well along in their production schedule, are health education, taught by an M.D. on our staff, and an elementary school German course, sponsored by the county schools.

Why think in terms of the entire community? Consider the so-called "trapped housewife." Has a community college no responsibility to her? We think it has. She may enroll in the KCSM-TV curriculum and meet occupational or educational goals by taking formal lessons in such courses as shorthand, typing, x-ray technology, data processing, as well as courses leading to a full academic degree. She might also take a course in the history of art or fashion illustration to satisfy her curiosity or to stimulate her sense of the creative and aesthetic impulses within her.

Regard the semi-skilled worker who wants, without the means, to upgrade himself in his job. He cannot physically attend his community college. Has the college no responsibilities to him? We think so. Through the television facilities of KCSM, he can and will take such courses as machine shop, welding, basic electricity, drafting, or photography, and other televised courses offered by Channel 14.

Regard the thousands of workers seeking information, expert advice, and direction for their everyday business of living. Tele-courses are being developed in such subject areas as safety on the job, water safety, safe driving, home nursing, first aid, legal problems facing homeowners. We believe that KCSM-TV will become their "community college."

With television from College of San Mateo, on-the-job training can be accomplished. We will receive registration applications from hospital attendants who wish to take the series of lessons on caring for the aged and ambulatory patients; from dental assistants who have been asked to view the lecture-discussion series on modern technology in dentistry; from Boy Scout leaders and teacher-association members; from United Crusaders who want to be truly "united" to form and establish operating policies and to absorb other useful procedures.

The student who attends a college class in person will also derive satisfaction through this "window of exploration." On television, the very best teachers we can muster will confront him with the most effective, proven, visual and audio aids. Each presentation will be done in the most memorable manner known to a team of "behind-the-scenes" professional educators. The student will have a "front-row" seat—even if his name starts with a "Z"—at every class meeting. He will be at "forceps" distance when watching lab demonstrations taking place in another room in the same building, and will maintain his vantage point when complex international experimentation is performed. He will sit virtually in the presence of the great minds of our time. He will not be forced by the sheer number of his peers to wait until his graduate-school years at some ivy-league university to be confronted with such people as Margaret Mead, Edward Teller, or Paddy Chayefsky.

If he is a slow student, he will have the unparalleled advantage of direct and individual help from his classroom teacher. She will be released by the presence of the TV teacher to assist each pupil with the lesson being presented.

Every teacher facing the camera will look directly into the "eyes" of his audience. His students will watch his every gesture, his every facial expression from a distance not possible in any classroom. We intend to see to it that the master teacher will make his teaching even better for his TV presentations—that he will prepare each lesson with great care—making his descriptions more economical, his concepts more vivid, his ideas more significant. Other teachers will have the unprecedented opportunity of seeing their colleagues in action and will contribute their ideas and special talents to the program to have their share in the preferred stock of "total education" for all.

A UNIQUE MEDIUM

A unique medium? We believe it is. But by being unique, it is by definition largely unexplored.

Inquisitive television cameras, together with the focused creativity of teachers and trained television crews, will bring field trips into classrooms. The KCSM-TV remote van—a completely portable studio—will provide students, on and off campus, with prerecorded field surveys. A botany class will see close-ups of unusual hybrids found along the San Mateo foothills; a physics class will go "on tour" through the nuclear accelerator at Stanford; a chemistry class will "visit" a smelter and observe electrolytic processes; a California government class will see local and state officials in their own offices, and hear in detail some of their answers to penetrating questions about the problems they encounter as they deliberate the laws we all live by.

Instruction by means of television presents a large number of problems not normally encountered by the school administrator. No longer is it sufficient to provide the teacher with a blackboard, a few maps or a laboratory filled with paraphernalia. It is now necessary to provide a studio, elaborate electronic equipment and technicians with an electronic and mechanical know-how such as has existed nowhere else in the school system.

So important do we consider the administrative aspect of teaching by television that the College of San Mateo has established, in addition to a Director of Evening College, Director of Day College, and Director of Summer Session, a fourth new area under the administrative direction of the Director of the College of the Air. Not only is the Director of the College of the Air responsible for establishment of a physical plant, but he must assist in acquiring suitable technical equipment, provide for the acquisition of a television channel, obtain Federal Communications Commission construction permits, and finally, purchase and install the equipment.

The equipment in itself is useless without a skilled and trained crew. In no other area of education will a teacher have the backing of as many technicians and experts as he will in television teaching. At the College of San Mateo a minimum crew will consist of 10 to 12 people—camera man; floor man; lighting man; control board man; audio directors and producers; moving picture camera men capable of supplying short segments of necessary outside material; photographers, who are able to prepare still pictures; and graphic artists, who with a stroke of a pen, are able to produce realism not obtained by the camera technique. Several members of this crew will be students trained to operate the television equipment. While the effort that goes into a successful television production seems excessive, it must be remembered that the medium has the capability of reaching into hundreds and thousands of homes, into multiple schools, and may be captured permanently on video tape for repeated showings. The medium truly represents a challenge to the ingenuity, resourcefulness and imagination of the teacher, but the material must be presented in a professional manner, because unconsciously or otherwise, schools will in television compete with the commercial entertainment field in the excellence of the picture production.

CLOSED CIRCUIT NETWORKS

College of San Mateo is expanding, but its new campus sites will be interconnected by television closed circuit networks to enable a master teacher from one campus to lecture to students attending other campuses. There will be no excessive duplication of complex experimental equipment; no urgency to recreate standardized materials, coursework, or facilities; no time lost by transporting faculty from one campus to another. It can all take place with a well planned "flick of a switch."

We believe that television can ease the burdens of teacher-time and excessive enrollments. We believe that KCSM-TV will make knowledge possible

for, and palatable to, the uneducated and will concentrate the public's attention on the development and achievements of mental power. KCSM-TV is designed to make education available in the home as well as in classrooms on the campus; to all people at all times.

MERLIN G. COX

FIVE-COLLEGE COOPERATION IN DEVELOPING AND TEACHING A COURSE IN WESTERN CIVILIZATION VIA TELEVISION

INTRODUCTION

Teaching by television requires more energy, preparation, and organization than traditional instruction, but it is nonetheless rewarding. There are the opportunities to reach noncredit students and make new friends in the wide area served by television. There are the serious hours of planning and taping, and the letters of appreciation to be answered. But there are lighter moments, too. We received a letter from a prospective college credit student very recently. It contained an unusual reason for taking our course. "I am taking this course," the lady explained, "because I had an operation. I have to take pills from not being able to keep enough blood in my body. This course helps me to take the pills."

THE NEW DIRECTIONS

I represent five of Florida's public junior colleges as coordinator of a committee which is responsible for planning, instructing and evaluating television courses. This report summarizes the work of the colleges in developing and teaching a TV course in Western Civilization.

The unique quality in our televised history classroom was not the use of television facilities for college teaching. Florida has been a pioneer in educational television. The new direction is evident in the unprecedented cooperation among colleges, the administrators, and faculty members, in achieving specific objectives in television instruction. The results have also convinced us that team teaching can be effective via television.

Fifteen college instructors, chosen from the fields of social science, history, humanities, and the fine arts, participated in the instruction of this course in Western Civilization. Five instructors, representing each of the participating colleges carried the primary instructional responsibility, with the other participants serving as guest lecturers in their special areas. Also involved in the planning of this course were the presidents, deans, and community relations directors of the cooperating junior colleges, representatives of WESH-TV, Channel 2, and representatives of the television division of the Florida Institute for Continuing University Studies.

Each participating college offered three semester hours of credit for the televised Western Civilization course during the second semester of the school year 1963–64. The second half of this televised course will be available to students of the five colleges during the first term of the school year 1964–65.

COOPERATIVE EFFORT

Five colleges cooperated in television teaching developed from the community junior college concept. Daytona Beach Junior College recognized its obligation to make available to the community all the opportunities implicit in its function. During the past six years the college has programmed a wide variety of radio and TV programs in the interest of extending educational opportunity as widely as possible. Thousands of area people have benefited. Programs and series currently in production and broadcast this year included:

Spanish Class of the Air
Florida History
Exploring Music
Civil War History Class
Singing America
Exploring Latin America

The enthusiastic response of statewide viewers to the televised Florida history course convinced the representatives of commercial television media that educational programs could be both entertaining and highly informative. Approximately five thousand noncredit viewers purchased the course syllabus. Letters of appreciation came from thirty-eight Florida counties. (WESH-TV covers more of Florida than any other television station.) The early hour of 6:30 a.m. would mean, we had presumed, a small and limited audience, but this simply was not true. We relived Florida's long and exciting history by means of television. Indeed, the response to Florida history was so favorable that representatives of the college and station WESH-TV decided to expand the offerings and audience by inviting other interested public junior colleges in the 38-county area to participate.

PLANNING A COURSE IN WESTERN CIVILIZATION

The four public junior colleges which joined Daytona Beach Junior College in planning and producing the televised course in Western Civilization were Brevard, Lake Sumter, St. Johns River, and Central Florida. The various cooperating agencies, the colleges, the Florida Institute for Continuing University Studies, and the television station, planned several directions for the TV series. Such matters as course credit, time of the program, publicity, and taping of the series were planned. The station agreed to supply the program time at 6:30 a.m. each week day with no charge to the cooperating colleges, and it agreed to the production staff, supported by talented junior college students working as interns.

A Junior College Television Committee then began planning the actual course. The History of Western Civilization was chosen as the course, and it was decided that the time and services provided by a commercial television station should be accepted, thus providing opportunity to reach many thousands of people with virtually no cost to the taxpayer or the participating colleges. It was agreed that the History of Western Civilization should be presented in terms of man—as an artist, a philosopher, a poet, a worshipper, a warrior, a politician, and a producer. Guest lecturers would be invited to discuss some of these facets of man.

It was the committee's opinion that 80 half-hour lectures would be required for the Western Civilization course, with six reviews well spaced throughout the course. With respect to the nonpolitical aspects of a Western Civilization course, a matter on which historians often disagree, committee members compromised and adjusted their difference. The committee further decided that I should prepare a syllabus for the course, to be made up from outlines and questions prepared by the scheduled lecturers.

The Committee decided that a coordinator on each of the five college campuses should meet with all students, registered for credit, a minimum of once each month for discussion, written quizzes and questions regarding the television lectures. Sessions were to be held in the evenings for three hours.

The committee then assigned major topics and lectures for the first half of the course in Western Civilization as follows:

MAJOR TOPICS	NUMBER OF LECTURES
Primitive Man	1
Mesopotamia	1
Egypt	1
Small Nations	1
Cretan and Aegean Civilizations	2
Greek Civilization	10
The Grandeur that Was Rome	10
The Asian Way of Life	2
The City of God	3
The Early Germanic Kingdoms	2
The Near East	4
The Middle Ages	4
Nations in the Making	4
Faith, Thought and Art in Medieval Europe	6
Europe in Transition	5
Renaissance	6
Reformation	5
Competitive State System	7
The Non-European World	6

The telecasts were scheduled to begin on all five campuses, February 17, a date that approximated the beginning of the second semester for each school.

PRODUCTION OF THE COURSE

Meanwhile, production began. Most of our lecturers were inexperienced in television production, so minor problems were encountered. Directors and engineers assisted, however, in technical aspects of instruction.

From the viewpoint of the historian, the TV medium proved to be more effective in many respects than the more traditional classroom. An abundance of maps, charts, paintings, and artifacts contributed to improved student understanding of history. Many of these visual aids represented expenditure of considerable time, money, and talent. These aids definitely would not have been used in the normal classroom or lecture situation. The Ringling Museum of Art, for example, contributed reproductions of the finest art of renaissance and baroque periods. Guest lecturers made serious efforts to project their specialized knowledge of music, painting, architecture, medicine, and religion. Instructors, some of whom had been teaching for twenty years, watched themselves on television, discovered flaws in their presentations, and became better teachers.

Lecturers concluded that a television lecture requires three to four times more preparation than the usual classroom lecture. But such preparation results in improved organization and a better selection of the truly significant concepts to be presented. Taping of this course was completed on May 14, the final lecture was aired on May 31, the final examination was taken simultaneously on five campuses, and then we attempted to evaluate our achievements.

EVALUATION OF FIVE-COLLEGE COOPERATION VIA TELEVISION

Instructors found a high correlation between student grades in comparable classes taken on campus and grades earned in the five-college television course. When we have completed additional courses and have more evidence upon which to base these correlations, we may find that the better, more motivated students perform at a higher level in the television courses, but that the slow student may have a tendency to procrastinate or to sleep late when his status is not immediately threatened by the daily roll call or quiz.

To evaluate our televised course by credit students, we used a questionnaire prepared by the Florida Institute for Continuing University Studies. Approximately two hundred credit students completed the questionnaires. Students evaluated the teachers, the presentation, and the course content as follows:

I. THE TEACHER

	Poor	Adequate, but below average	Average	Above average	Excellent	Completely outstanding
1. Convincing, believable				33%	60%	7%
2. Pleasant personality			6%	42%	40%	12%
3. Forceful personality			6%	50%	38%	6%
4. Speech patterns				45%	55%	
5. Command of course subject				20%	60%	20%
6. General impression				43%	50%	7%

II. THE PRESENTATION

	Poor	Adequate, but below average	Average	Above average	Excellent	Completely outstanding
1. Approach dynamic			7%	60%	26%	7%
2. Fits intended audience				33%	67%	
3. Use of visuals		2%	4%	60%	28%	6%
4. Timing (not too fast or too slow)		2%	12%	42%	37%	7%
5. Interest maintained			8%		78%	14%
6. Learning motivated			15%		68%	17%

III. THE COURSE CONTENT

	Poor	Adequate, but below average	Average	Above average	Excellent	Completely outstanding
1. Basic structure evident			14%	18%	60%	8%
2. Purpose made clear			12%	20%	48%	20%
3. Scope adequate (covers the material)			12%	25%	35%	28%
4. Organization (logical, clear)			7%	40%	30%	8%
5. Suited to student needs			5%	40%	55%	
6. Leads to further exploration of the subject			20%	60%	20%	

Administrators and instructors representing all the five colleges are favorably impressed with the number of college graduates, high school students, professional men and women, retirees, and even unskilled laborers who have evidenced interest in the course for noncredit.

A man who dropped out of high school wrote, "I never acquired much education and therefore missed much regarding world civilizations, architecture, etc. I do read a great deal, but these lectures, with their illustrations, constitute an education in themselves."

One circuit judge is a strong supporter of our televised history programs. "My friends and I are grateful to the instructors and to WESH-TV for the fine, unselfish participation in making such courses possible," writes Judge Robert Wingfield.

A county school official added a word of encouragement. "Congratulations to you and the staff which you have assembled on your very excellent presentation of Western Civilization.

An engineer wrote, "Although I am not following the World Civilization course you are giving on TV for college credits, I am happy to have the opportunity to learn more about this subject. I do hope that you will be able to continue with further educational courses that will appeal to many people in the TV audience. You are presenting the course in such a way, that the people of those long ago days have come alive. As coordinator you should be very proud of the jobs you and your committee are doing."

A college student said that, "The pursuit of Ancient History in most colleges can be compared to a picnic in the midst of the Sahara Desert—its awfully dry and dusty, but I can truthfully say that I have never enjoyed a course more than this one. The material . . . has been presented in a most exemplary manner by extremely competent people and provides a refreshing change of pace as history courses go."

A retiree sent his encouragement, urging us to "keep up the stimulating program, . . . on the basis of making this a way of life that we do not live for ourselves but for others . . . you are making a great contribution toward making life worth living."

On the basis of hundreds of letters, phone calls, and words of encouragement received by the participating schools, it can be understood why we feel that five-college cooperation in developing and teaching a course in Western Civilization via television is worthy of consideration as a new direction in education.

HOWARD B. HITCHENS, JR.

IMPROVING INSTRUCTION THROUGH THE USE OF TELEVISION: AT THE UNITED STATES AIR FORCE ACADEMY

We feel that the inclusion of new media in the instructional process is one of the most vital steps forward that American education can take. I propose to raise a few issues which we perceive in the use of instructional and/or educational television at all levels of education. After I have reviewed the issues briefly, I will attempt to communicate what progress the Air Force Academy has made toward resolving them. Finally, I will try to draw some inferences on the basis of our experience which may be of help to the junior colleges of the United States.

FOUR ISSUES

The largest issue in the use of television in education is how the educator can take advantage of the qualitative benefits of the medium. When educational television experimentation began in the 1950's it was conducted within the framework of the population and knowledge explosions which lay ahead. Therefore, television, basically a communications medium, was used to spread the talents and influence of each teacher over more students. It was demonstrated in many studies that television was as effective as "conventional instruction" in most instances. It is my position that we have not yet really reached the halfway point in exploiting this medium. For instance, I observed in 1958 at Hagerstown, Maryland, that those in charge of the school TV program, a pioneering experiment, used two subject matter experts (teachers) for both production and teaching, as opposed to the use of professional directors in production. This kind of innovation, where two teachers alternate between teaching and directing, will give rise to qualitative benefits. These teachers, who know the subject matter intimately, are the most qualified people in the whole process to determine what visual and aural experiences the students will receive. And, there has been some evidence that the relationship between sophistication of production techniques for educational television and learning effectiveness is not necessarily a strong one; while we have exploited television to some advantage, we still face the question: how can we best use the television medium in education to get the improved instruction and the learning effectiveness and efficiency that we seek?

The second issue revolves around the question of how to convert a one-way communications medium to two-way conversation? Much experimentation has been done in this area, but until very recently it has been concluded that this is unnecessary or technically unfeasible. But research continues into the matter of how to elicit and use student responses or instructional media and methods. It appears that the relationship between technical sophistication of the response system and difficulty in implementation is a highly positive one. The technology to date leaves much to be desired in the development of an economical and easy-to-use response system for televised instruction.

The third issue revolves around the matter of integrating the television medium into an instructional system. Or is the instructional system really just a television system? Is the television producer the educator is the educator the television producer? Some institutions have introduced television as a "way of teaching" and have set it up as a separate empire which purports to solve all of education's problems. In these situations the good will of the faculty is often lost, making it difficult to adequately use television to implement instruction.

It is my impression that the reason for the separateness of television from other instructional resources in most institutions is that this complicated electronic equipment costs more money than do other aids and materials available to the teacher. It is the school's orientation to the dollar which makes for this separation. Must we have a separate television organization? Isn't it more reasonable to organize so that television can be made available to the instructor on the same basis as are overhead transparencies, or reserve book shelves?

We must take another look at the actual production techniques used to make learning experiences available to students through the cathode ray tube. It should not automatically be assumed that the provision of picture and sound necessitate at least two cameramen, a floor manager, a technical director, a producer-director, a script girl, a video engineer, and an audio engineer.

These are the issues, then, to which I am addressing myself: (1) How do we achieve the qualitative benefits which have not yet been much more than hinted at in educational television; (2) What is the relationship of student response to the use of the television system for education; (3) How can we keep television as a part of the instructional system rather than letting it become the instructional system; (4) What are the most appropriate production techniques in the use of television for instruction?

TELEVISION AT THE ACADEMY

We have addressed ourselves to these issues at the Air Force Academy in introducing an educational television system. At the Academy we have a concept of minimal production which we call "instructor-centered television." This method is valid, not only workable but desirable, for the bulk of instructional and administrative processes.

This method is not our only capability. We have introduced this system as a part of what we call our multiple-option concept for the use of television. Simply stated, multiple-option television provides a full spectrum of means for television production—equipment, technical operations, personnel, and production patterns—which in flexible combinations of systems and subsystems is able to obtain the highest effectiveness as measured by achievement objectives for the lowest cost as represented by materials, time, people, and equipment. By giving ourselves more than one objective, we are able to use television for the presentation of a number of events and activities which cannot be conveniently or adequately originated by the instructor-centered method. These include interviews, dramatic presentations, and unobtrusive recording of classroom activities for the training of teachers.

Apart from local origination, there are many uses for a television facility for distribution of resource materials from film companies and libraries, from television centers at other institutions—in our case, military installations—and some commercial broadcasting resources. At the Air Force Academy a great deal of our television capability was devoted in the last academic year to the projection of motion picture footage into the classrooms. This was expeditiously handled at the master control center by technicians, prompted by the instructors. It was tightly scheduled and had the benefit of reducing lost effort by the instructor in running a projector in the classroom and/or loss of time by students while they moved from small classrooms to large auditoriums for film showings.

Considerable attention must be devoted to the receiving end of televised instruction. Many of the principles of programmed instruction can be applied to television presentations, and the instruction-centered television pattern has a great impact when used as a means of directing and insuring student activity, as well as presenting information. Television presentations need to be supplemented in most cases by other individual and group activities involving students and instructors face to face. We have found that a technique of directing the completion of printed, programmed materials by the students through the use of the television medium can be very effective and efficient. For example, in our beginning aeronautics course, the instructor presents a 20-minute videotaped segment of an instructional program on the subject of cycles. The instructor elicits student responses to printed programs which are before them on their tables. The students are located in small classrooms, no more than 15 students per classroom, with an instructor in attendance. At the end of the 20-minute instructional program, the remaining 30 minutes of this instructional period will be consumed by activities directed by the classroom instructor. This activity normally will consist of exercises and board work by the students. The instructor in this case is in a room by himself and has complete control of the picture and sound which are presented to the learner.

TOTAL MEANS OF INSTRUCTION

We use televised instruction as a total means of instruction only when there is no other alternative—when it is not worthwhile to set up complete staffs for new, peripheral subjects. Our academic skills course, a noncredit one-semester course, is an example. The subject matter of this course, presented in programmed lecture form, covers the management of time, listening and note taking, the use of the library, the process of writing, memory training, studying for examination, and, for the largest block, reading, subdivided into fundamental reading skills, study reading skills, and accelerated reading skills. The course is extended on an optional basis to include typing. If taught in the ideal Academy pattern, sixteen instructors would be required. With television, only two are used. Thus, we are attempting to take advantage where possible in our program of the ability of television to make one teacher do the work of many. But our intent is to hold the line for as an ideal an instructional situation as we can, while resisting the inroads of the population explosion.

For the student response we issue what we call oral programmed instruction. Taking students through printed programs in lock step reduces the requirement for an audio feedback system. However, we have supplemented the system, on a very limited basis, with the use of an electric response system in which the student can indicate his responses to specific activities or questions by pressing buttons. The more effectively the instructor has organized the content of his presentation over the television system, the less likelihood there is that questions will be raised. In addition, by having subject matter experts in the classroom with the students, questions can be handled after the formal TV presentation. In this way, interaction with a teacher is still possible even though we are using television.

In organizing for television at the Air Force Academy, it was felt that the most beneficial way to look at this electronic medium was to consider it another audio-visual aid. It certainly has many of the same characteristics as motion picture film projection, and traditionally, most institutions consider motion picture film the prime audio-visual aid. It seemed only logical to carry this a step further and to place the operation of TV under the control of the activity which has traditionally had responsibility for all non-book instructional materials. The television center is a part of the activity of the Directorate of Audio-Visual Services. It is another service provided to the faculty by that organization. Organizational economies are achieved with this approach. In the first place, by combining all audio-visual activities into one organization, a separate graphics support shop does not have to be provided in order to make visual materials available for the television teacher. Secondly, additional film handlers do not have to be hired in the television center. The skills of the projectionist in the traditional film library service organization can be made readily available to service the film-handling and projection activities of the television facility.

Other interesting uses we have made of our television system are: (1) the recording of student speeches in the classroom for subsequent playback and critique by the instructor; (2) the distribution of a program called "Modern Math for Parents" into the 1300 homes which are tied into our closed-circuit distribution system. This program was locally produced and permitted question and answer activity by telephone while the television teacher was on the air; (3) the exchange of video tapes with Headquarters USAF and some major commands, bringing various resources not normally available into the classroom.

Finally, the provision of a complete range of production techniques is more likely to insure that we will get a step farther down the road toward the realization of the qualitative benefits of the television medium. My final plea is to put the instructor in control of the television medium; put this bit of technology at his disposal. Don't let Rod Serling decide which visual and oral experiences your junior college students should have. Reserve those decisions for the teacher in your institution—the implementer of the curriculum—the person with ultimate responsibility for student learning.

MICHAEL M. BENNETT

EDUCATIONAL TELEVISION AT ST. PETERSBURG JUNIOR COLLEGE

St. Peterburg Junior College has been involved with educational television since 1957. Our first efforts were in cooperation with the area educational television station WEDU—Channel 3. Considerable time, effort, and money went into this venture. The results were anything but spectacular. Perhaps a dozen people registered for credit in political science and general biological science, the two subjects offered. We were assured by the station management that "at least 10,000" were viewing. When pressed for evidence, however, there appeared to be none. The only enthusiastic and generous response we have experienced from open circuit television came about this past winter when we televised our home basketball games.

We are still involved with open circuit teaching in cooperation with the Florida Educational Television Commission. The Commission furnishes the tape and equipment, the college furnishes the instruction. Credit is granted by colleges agreeing to accept the responsibility for registration, testing, and recording of credit and grades. Other colleges and universities in Florida are also involved in much the same procedure.

Our lack of enthusiasm for open circuit educational television is considerably offset by our confidence in the place closed circuit television is making in our educational picture.

Florida is no exception to the national trend in enrollments. Based on the number of students already enrolled in grades one through twelve in its district, St. Petersburg Junior College expects to triple its enrollment by 1975.

There appears to be a limit to the traditional process of first determining enrollment then providing instructors on an average ratio of one instructor for every 25 students. We cannot continue to build classrooms designed to seat a maximum of 35 students. Nor can we provide extensive individual counseling during the registration process. Nor can we expect the supply of well qualified instructors to exceed the demand. *And so on.*

CLOSED CIRCUIT TV

Teaching via closed circuit television appears to have possibilities for assisting in meeting some of the challenges. Accordingly, at St. Petersburg Junior College classes enrolling 220 are taught with the assistance of closed circuit television in general biology, political science, earth science, and psychology. Classes meet in large groups two hours each week and in small discussion sections once each week. Instructors are assigned responsibilities consistent with their talents: those who are effective on television present lectures over closed circuit television; those who are effective as discussion leaders are placed in charge of small sections; and some are given both types of responsibility. Under this plan, instruction is improved because time is available for the careful planning of instruction, and teachers engage in activities for which they are particularly qualified. With the use of television there is better provision for viewing of visual instructional materials.

We have moved a long way toward departmental examinations in our general education core subjects. This, in turn, requires some assurance that different students in these courses are being exposed to essentially the same materials in the same way. I believe we are achieving this through closed circuit television. The impact of instruction upon the student appears to be stronger in the television classes than in those taught by conventional methods. The visual aids used in teaching by television are selected with meticulous care. Also department-wide planning appears to be in greater evidence when television is employed. We have, in closed circuit television, a means of increasing quantity.

Based upon our experiences since 1957, I offer for your consideration the following ideas which have been voiced by others as well as myself:

1. The governing board and administration must make a strong commitment in favor of educational television. It is not a means of saving money, especially during initial stages of development.
2. The equipment must be in good working order and it must be professionally operated. Beware of becoming a field laboratory for new equipment.
3. A clear understanding must be reached with the faculty as a whole in regard to the objectives and procedures to be followed.
4. Remain flexible. There very likely will be opposition—sometimes vociferous, sometimes more subtle. Sometimes it is right.
5. Build in research. It provides a solid base for decisions regarding recommended changes which will almost inevitably flow from many sources. Move slowly, but surely.

Television provides a tremendous opportunity to serve our expanding demands. It is an almost inevitable alternative to a continued commitment to the traditional.

JAMES L. LOPER

THE JUNIOR COLLEGE AND EDUCATIONAL TELEVISION IN THE LOS ANGELES REGION: PLANS AND DREAMS FOR CHANNEL 28

For nearly ten years community groups throughout the United States have had the exciting, stimulating and sometimes difficult job of serving as midwives to an infant that seemed slow in coming. An infant that some critics felt would never come of age. An infant that has sometimes rightfully been called "retarded" and "dull." But, while progress may be exceedingly slow, this same infant with the somewhat ambiguous label of educational television can look forward to one of the brightest futures ever offered to a new medium of communication.

I say the label education is ambiguous because such a vast variety of programming can go under that name—programs of direct systematic instruction, programs of education for children, for young mothers, and for the physically homebound, programs that are entertainingly informative, and those which are informatively entertaining, programs that range from practical gardening hints to a discussion of a remote existentialist philosopher. All of these can be and are found on the schedules of educational television stations. As diverse, too, as the programming, are the methods of operating and financing these stations.

First, there are the single agency stations operated by a school, college, or university. In these cases, operating expenses for the station are included in the institution's budget. An example, of course, is KVCR-TV operated by San Bernardino Valley College, the first station licensed to a junior college.

Second, there are joint operations where two groups hold a license for common control of the facility. KCTS-TV, in Seattle, operated by the University of Washington and the Seattle Public Schools is such a station.

Third, there are the stations owned and operated by state networks. Alabama now has four stations on the air which virtually cover the entire state. Florida has a state ETV commission which coordinates the efforts of stations operated by several different types of agencies, and Ohio is moving in the same direction.

In the first three types, the majority of financing usually comes from some form of tax support. The individual viewer is not asked to make a direct contribution, except, perhaps through subscription for the viewing guide or calendar. The advantage of these types of operations is that there is continuing assurance of funding for staff, power, and program contracts. The disadvantage is that all elements in the community do not have a voice in the programming or in the determination of station management. For these reasons, in cities where civic pride and responsibility have long prevailed, there are likely to be "community" educational stations. In this case, a board of directors representing many different educational and cultural elements organize for the express purpose of placing a community station on the air.

COMMUNITY APPROACH

We are planning a "community" ETV approach in the Los Angeles area. In January, 1964, Community Television of Southern California was awarded a construction permit by the Federal Communications Commission for a station on Channel 28. At the same time, a federal grant was made by the Office of Health, Education and Welfare to facilitate construction. Cost of construction will surpass $1,000,000. The first year's operating costs are estimated to be nearly $700,000. Activation of the station, which has a potential audience of more than eight million people, is the result of careful planning and hard work for the past three years.

The original purpose of the group was to acquire and operate one of the seven commercial VHF television stations which have operated in Los Angeles since the late 1940's. However, in 1963 it was decided to activate the reserved UHF frequency, instead. There were several reasons for the change. First, the price of VHF stations recently has risen to the extent that it would now probably be necessary to pay at least twice as much as the six million dollars paid for the commercial which was purchased by educational interests in New York City. Second, Congress passed legislation which requires all television receivers sold in interstate commerce to have both very high frequency and ultra high frequency. While it will be some years before there is a major penetration of the Los Angeles market with UHF sets, the possibility does exist that UHF and VHF can exist side by side on somewhat equal terms within the near future.

Community Television of Southern California has been fortunate in building a board composed of some of the leading figures in business, education, and industry in Southern California.

One of the nation's leading experts in educational television was employed as vice president and general manager of KCET. He is James Robertson, who comes from National Educational Television where he was Vice President for Network Affairs. Prior to that time, he was instrumental in the activation and operation of Chicago's WTTW, one of the nation's outstanding stations.

KCET's Director of Programming is James Case, formerly Program Director and Assistant General Manager of KRMA-TV in Denver. During his tenure at this station, Case originated and produced some of the outstanding creative series carried by National Educational Television Center.

KCET is somewhat unique among community television stations in that the Director of Educational Services, who is responsible for school, college, and university programming, is on an equal basis with the Director of Programming. This, we feel, is essential, for KCET was licensed to be of service to schools, as well as to provide a much needed alternative cultural program service.

BROADCAST PLANS

What will such a station broadcast? I will quote from the program section of the FCC application.

The proposed station's programming policy will be designed to meet the massive needs for educational and cultural television programming of the Los Angeles area. The proposed transmitter, located on Mt. Wilson, will provide coverage of the entire Los Angeles metropolitan area, the population of which now approximates eight million people. It is a more than three million family market, second largest in the United States. Several of the nation's leading higher educational institutions are located in this area—the California Institute of Technology, University of California at Los Angeles, University of Southern California, the Claremont Colleges, the Riverside and Irvine Campuses of the University of California, campuses of the California State College system—a total of over 30 accredited institutions with a total enrollment exceeding 130,000 students. This area contains the largest concentration of scientists and engineers and highly skilled technicians engaged in space age research and production in the United States. The result is that the population of the area contains an unusually large proportion of individuals with above average academic training. These people form a larger basis for the support of educational and cultural television than exists anywhere else in the country with the possible exception of New York. The remarkably successful programs in adult education developed in recent years by the University of California at Los Angeles support this conclusion.

The weekday hours between approximately 9 A.M. and 4 P.M. will be made available to the public schools of Los Angeles City and County for in-school instructional use. Additional afternoon time of approximately one hour daily will be made available to these school systems for teacher-training materials. At the outset, one-half hour of afternoon time and one-half hour in the early evening will be available daily for adult education purposes.

A system of representative committees is already in operation to assure the optimum use of the station's facilities for instructional purposes. Overall supervision is provided by the Educational Advisory Council. The Council has for its members the heads of all major educational institutions in the proposed coverage area. At the next level is the Education Planning Committee, made up of the top deputies to the members of the Council, which will be responsible for the more detailed planning of the format of the proposed station's instructional programming. Finally, the Instructional Television Committee, made up of professional personnel in the field of ETV from the various educational institutions, will offer direction at the operational level. This committee has been in existence for nearly two years, and members have had actual experience in the supervision of the instructional programming which has been broadcast by the Los Angeles commercial stations. In addition to the schools, time will be made available to the City and County governments for in-service training of its personnel.

The remaining afternoon and evening hours will be utilized, as appropriate, for cultural entertainment, news, discussion, ... and other programming of high quality for the adult and children audiences. A substantial percentage of this programming at the outset will consist of tapes provided by the National Educational Television Center (NET), with which the station will be affiliated. Plans are under way for use, as feasible, for an increasing volume of local-programming as it can be developed. KCET believes that the Los Angeles area is exceptionally well endowed with creative talent for this purpose, including the large concentration of personnel in the local motion picture and broadcasting industries. NET, recognizing the potential of the Los Angeles area, has already approached KCET with the objective of having the station produce programs for distribution throughout the country. Construction is now under way for studio facilities which will make this possible.

But how can KCET relate to the junior colleges located in the metropolitan complex that is Los Angeles? At last count, there were some 27 two-year institutions of higher education located in the extended coverage area of the station. Many of these colleges are already using television.

A SERVICE AGENCY

It should be noted that KCET considers itself to be primarily a service agency to education at all levels. It would be presumptuous for the station to try to determine curriculum needs in so vast and complex an area. Thus, it is a firm policy that all instructional programs must be produced by or in cooperation with recognized accredited educational agencies which see a need to utilize the station.

This does not mean, however, that KCET cannot suggest how certain educational problems could be solved or assisted by using television. It is the duty of any such organization as Community Television of Southern California to advocate the use of new media in education; to conduct and publish continuing research into the effectiveness of television in education; to operate with experts who know and understand education as well as television; to maintain the finest possible production facilities; to assist in the proper development and application of educational television facilities; and to inform the schools of programs useful in instruction.

JUNIOR COLLEGES AND KCET

How can junior colleges utilize KCET? They can take advantage of the adult cultural and informational programming as classroom extracurricular viewing by college classes. To this end, we are prepared to offer assistance on schedules, program content, and utilization. They can use the station's studios for production of educational TV materials for their own use. The modern equipment and trained personnel of the station can be provided at a lower cost than would be necessary for installing and operating a complete production facility. One of the great concerns of those of us who have watched the somewhat unchecked growth of school television is that there has been costly duplication of facilities, in some cases operated by untrained personnel.

Furthermore, we believe the expanded use of open-circuit television for teaching can help to bring about greater interinstitutional cooperation among the two-year colleges of higher education in Southern California. By cooperation with the station in the development of basic TV courses, the colleges can alleviate teacher shortages, need for expansion of physical plants and for laboratory equipment, and other problems related to rapid growth.

Finally, I look forward to the time when an educational television station, such as KCET, becomes a unifying agent among all levels of education, when the needs and desires of the student are placed ahead of the cumbersome barriers that isolate our various levels of education. I look forward to a time when a student may enroll for a course offered cooperatively by a university, state college, junior college, and private institution, and find that credit is readily transferable among all schools. A time when there is greater utilization of the magnificent amount of brainpower available when private industry, government, and education combine to tackle the job of educating young people for the undreamed-of future.

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Occasional Reports from UCLA Junior College Leadership Program:

1. Frederick C. Kintzer. *Faculty Handbooks in California Public Junior Colleges* (Junior College Leadership Program, Occasional Report No. 1), Los Angeles: University of California, Los Angeles, 1961. Price, $1.00.
2. Frederick C. Kintzer. *Board Policy Manuals in California Public Junior Colleges* (Junior College Leadership Program, Occasional Report No. 2), Los Angeles: University of California, Los Angeles, 1962. Price, $1.00.
3. *Institutional Research in the Junior College—A Report of a Conference* (Junior College Leadership Program, Occasional Report No. 3), Los Angeles: University of California, Los Angeles, 1962. Price, $1.50.
4. Frederick C. Kintzer. *President's Reports in American Junior Colleges* (Junior College Leadership Program, Occasional Report No. 4), Los Angeles: University of California, Los Angeles, 1963. Price, $1.50.
5. *Establishing Junior Colleges* (Junior College Leadership Program, Occasional Report No. 5), Los Angeles: University of California, Los Angeles, 1964. Price, $1.50.
6. *Islands of Innovation* (Junior College Leadership Program, Occasional Report No. 6), Los Angeles: University of California, Los Angeles, 1964. Price, $1.00.
7. *New Directions for Instruction in the Junior College* (Junior College Leadership Program, Occasional Report No. 7), Los Angeles: University of California, Los Angeles, 1965. Price $2.00.

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